IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Filed Feb. 11, 1966

THE FINNEY COMPANY, a partnership, Plaintiff, v. JFD ELECTRONICS CORPORATION, a corporation, and THE UNIVERSITY OF ILLINOIS FOUNDATION, a non-profit corporation, Defendants.	CIVIL ACTION NOS. 65 C 220 and 65 C 671 (Cons.)

ANSWERS BY PLAINTIFF, THE FINNEY COMPANY,
TO INTERROGATORIES UNDER RULE 33 FILED BY
DEFENDANT, THE UNIVERSITY OF ILLINOIS FOUNDATION

Pursuant to stipulations between plaintiffs and The Foundation defendant, plaintiff, The Finney Company, hereby answers interrogatories 1 to 6, inclusive, of the set of interrogatories served by that defendant on plaintiff July 21, 1965, and interrogatories 16 to 20, inclusive, of the set of interrogatories served by that defendant on plaintiffs November 15, 1965 (all as modified by agreement), as follows:

INTERROGATORY 1(a)

1. Referring to paragraphs 13 through 16 of plaintiff's Complaint:

(a) Specify, with respect to each patent in suit, all facts upon which plaintiff relies as a basis for the contention that said patents are void and invalid in law;*

Answer (By John F. Pearne)

Construing this interrogatory as referring to paragraphs 12 through 15 of plaintiffs' Second Amended Complaint (corresponding to paragraphs 13 through 16 of plaintiffs' original Complaint), and referring separately to each of the patents now in suit and to the several grounds upon which plaintiffs contend that each of those patents is void and invalid in law, the facts presently known to and relied upon by plaintiffs as a basis for each such ground as to each such patent are set forth in the following outline:

I. Isbell Patent No. 3,210,767

GROUND: The alleged invention described and claimed was described in a printed publication more than one year prior to the effective filing date of the patent.

FACTS: Vital facts not yet known to plaintiff, as regards claims 1 to 8, inclusive, are still under investigation and, hence, no decision has yet been made to rely at the trial on this

* This part of Interrogatory 1 was withdrawn by stipulation in view of plaintiffs' objection to the term "all facts." Thus, the answer given is, in effect, volunteered.

ground as to those claims. As regards claims 9 to 15, inclusive, however, the factual basis for this ground is as follows:

A. As to claim 9 of that patent, the alleged invention of this claim involves a broader concept than anything previously disclosed or claimed in the application; claim 9 to this concept and the first disclosure of comparable breadth were first filed in the application for this patent on July 20, 1961; and the subject matter of claim 9 was described in the following publications of more than one year earlier date:

Dwight E. Isbell
"Log Periodic Dipole Arrays"
Antenna Laboratory
Technical Report No. 39
University of Illinois
Published at least by September 21, 1959
(Entire Article)

"Research Studies on Problems
Related to ECM Antennas"
Quarterly Engineering Report No. 2
Antenna Section
Electrical Engineering Research Laboratory
University of Illinois
Published at least by May, 1959
(pp. 2 and 3)

B. As to claims 14 and 15 of the patent, the alleged invention of this claim involves a "cell" concept first disclosed and claimed in the application for this patent by the amendment filed May 13, 1965; and an antenna inherently conforming to the cell concept was described in the following publication of more than one year earlier date:

Robert L. Carrel
"Analysis and Design of the
Log-Periodic Dipole Antenna"
Antenna Laboratory
Technical Report No. 52
University of Illinois
Published at least by October, 1961

GROUND: The alleged invention described and claimed was in public use and on sale in the United States more than one year prior to the effective filing date of the patent.

FACTS: The factual basis for this ground is that:

A. As to each claim of the patent, if such claim is construed to cover any of plaintiff's antennas, the alleged invention of the claim was on sale in the United States in 1955 in the form of television antennas manufactured by Kay Townes Antenna Company of Rome, Georgia, and was in public use by its customers (none having yet been identified) in 1955, one of the antennas being known by the trademark "REAR GUARD" and another by the trademark "SUPER REAR GUARD" (Items 5 and 7 of prior art previously disclosed and described)*.

B. As to each claim of the patent, if such claim is construed to cover any of plaintiff's antennas, the alleged invention of the claim, in the form of television antennas, was on sale in the United States

* This and subsequent references to prior art previously disclosed refer to those numbered items of prior art disclosed to the Foundation defendant by plaintiffs on or about April 3, 1965.

in 1955 by Channel Master Corp. of Ellenville, New York, and was in public use by its customers (none having yet been identified) in 1955, one of the antennas being known by the trademark "K.O." (Item 1 of prior art previously disclosed and described).

GROUND: Alleged invention described and claimed was described in a patent granted on an application for patent by another filed in the United States before the invention or discovery thereof by the patentees.

FACTS: The factual basis for this ground is that, as to each claim of the patent, if such claim is construed to cover any of plaintiff's antennas, the alleged invention of the claim was described in the following prior U. S. patent:

Pat. No. 2,703,840 to Carmichael, granted March 8, 1955, on an application filed February 9, 1951 (See, particularly, col. 4, lines 26-31; col. 4, line 84, to col. 5, line 2; col. 5, lines 8-20; and Figs. 1-3)

GROUND: The patentee named in the patent did not himself invent the alleged invention described and claimed therein.

FACTS: Vital facts not yet known to plaintiff are still under investigation and, hence, no decision has been made to rely at the trial on this ground.

GROUND: The alleged invention described and claimed in the patent was such that the differences between the subject matter thereof and the prior art would have been obvious, at the time the alleged invention was made, to a person having ordinary skill in the art to which said subject matter pertains.

FACTS: The factual basis for this ground is that said differences would have been obvious, as asserted, in view of the state of the art as evidenced by the prior uses and prior patent identified on pages 4 and 5 hereof; by additional previously disclosed prior art Items 3, 4, 8, 9, and 10 further showing the equivalence of simple dipoles, folded dipoles, and modified dipoles, and their interchangeability for impedance matching purposes; and by the following additional item of prior art:

> R. H. DuHamel and F. R. Ore, "Logarithmically Periodic Antenna Designs," IRE National Convention Record, Pt. I, pp. 139-151, 1958 (particularly, p. 140, col. 2, lines 7-17, and table on p. 146 showing values for the angle ψ as small as 7°).

GROUND: The claims of the patent do not particularly point out and distinctly claim the subject matter sought to be patented.

FACTS: The factual basis for this ground is as follows:

A. Claims 1 to 8, inclusive, recite (directly or by reference in the case of the dependent claims) "A broadband unidirectional antenna," and claims 10-15, inclusive, recite "An aerial system for wide band use," all without clearly indicating how broad or wide a band or spectrum is contemplated.

B. All claims (and the specification as well) fail to specify or point out, in any manner, any relationship between the minimum number of dipoles required and any particular frequency range to be covered thereby in order to provide an acceptable degree of independence of frequency in the operation of the antenna, i.e., in order to achieve the objectives of the alleged invention set forth in the patent.

C. All claims except claim 4 fail to specify or point out, in any manner, any relationship between the magnitude of the spacing of any pair of successive dipoles and the lengths of half-waves to which those dipoles are respectively resonant as half-wave elements. When those two values are equal or nearly equal, the antenna will not operate as disclosed on such a wave length and the objectives of the invention will not be achieved.

D. Claims 1-3 and 5-8 define the significance of the constant T in the second of the two formulae by which each of those claims is limited (directly or by reference in the case of the dependent claims) only as having "the significance previously assigned," leaving it uncertain whether it was intended to mean that its value is the same in magnitude as the constant T in

the first of those formulae, which is what the specification discloses (col. 1), or was intended to permit the values of those constants to be different as long as both are "constant" and "less than 1," which the specification in no way discloses as being acceptable or even suggests as being operative to achieve any of the results attributed to the alleged invention.

E. Claim 9 refers to "at least one set of parallel dipoles," and claim 10 refers to "collinear pairs" of dipole elements, both without in any manner indicating how many dipoles are contemplated as constituting a "set" (in claim 9) or how many pairs of dipole elements are contemplated as a minimum number (in claim 10), or, in either case, how many are necessary to achieve any of the results attributable to the invention.

F. Claims 9 to 15, inclusive, fail to define what the specification teaches to be the alleged invention by failing to define the lengths and spacings of the dipoles according to the formula disclosed in col. 1.

G. Claims 14 and 15 refer to a "cell" concept for which there is no explanation or basis in the specification as filed or in the specification of the patent as granted (cf. Patent Office Rule 75(d)); and these claims

also rely upon undisclosed "cell" relationships to define the lengths and spacings of successive dipoles in a manner inconsistent with the requirements of the invention as disclosed.

H. Claims 14 and 15 expressly state that "a minimum of three" parallel dipoles may be employed, whereas the subsequently defined relationship of successive "cell" dimensions cannot have a "constant scale factor" relationship, as required by these claims, unless there are at least four parallel dipoles; and such relationship, in any event, would have no practical significance unless there are substantially more than four parallel dipoles constituting substantially more than three cells.

I. Claims 10 and 13 define the spacings of successive dipoles only by stating that they are "generally decreasing" from the longest dipole end to the shortest dipole end of the antenna, which is insufficient to achieve the objects of the invention or to incorporate the principles of the invention as disclosed.

GROUND: The claims of the patent embrace and purport to cover more than that which is disclosed therein as the alleged invention of the patentee and more than he had a right to claim.

FACTS: The factual basis for this ground is that in each respect in which each claim of the patent fails properly to define the subject matter sought to be patented, as detailed above, the claim embraces or is ambiguously susceptible to a construction embracing more than the alleged invention as disclosed in the patent and, therefore, more than the patentee had a right to claim.

II. Mayes et al. Patent No. Re. 25,740

GROUND: The alleged invention described and claimed was described in a printed publication more than one year prior to the effective filing date of the patent.

FACTS: Vital facts not yet known to plaintiffs are still under investigation and, hence, no decision has yet been made to rely at the trial on this ground.

GROUND: The alleged invention described and claimed was in public use and on sale in the United States more than one year prior to the effective filing date of the patent.

FACTS: Vital facts not yet known to plaintiffs are still under investigation and, hence, no decision has yet been made to rely at the trial on this ground.

GROUND: Alleged invention described and claimed was described in a patent granted on an application for patent by another filed in the United States before the invention or discovery thereof by the patentees.

FACTS: Vital facts not yet known to plaintiffs are still under investigation and, hence, no decision has yet been made to rely at the trial on this ground.

GROUND: The patentee named in the patent did not himself invent the alleged invention described and claimed therein.

FACTS: Vital facts not yet known to plaintiffs are still under investigation and, hence, no decision has yet been made to rely at the trial on this ground.

GROUND: The alleged invention described and claimed in the patent was such that the differences between the subject matter thereof and the prior art would have been obvious, at the time

the alleged invention was made, to a person having ordinary skill in the art to which said subject matter pertains.

FACTS: The factual basis for this ground is that said differences would have been obvious, as asserted, in view of the state of the art as illustrated by previously disclosed and described prior art items 9, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20 indicating the obviousness of and disclosing the expected results of Veeing dipole arms forwardly in a wide variety of types of arrays, including various multiple dipole endfire arrays; and by the following additional items of prior art disclosing basic log periodic arrays:

Dwight E. Isbell
"Log Periodic Dipole Arrays"
Antenna Laboratory
Technical Report No. 39
University of Illinois
Published at least by September 21, 1959

"Research Studies on Problems
Related to ECM Antennas"
Quarterly Engineering Report No. 2
Antenna Section
Electrical Engineering Research Laboratory
University of Illinois
Published at least by May, 1959

GROUND: The claims of the patent do not particularly point out and distinctly claim the subject matter sought to be patented.

FACTS: See earlier answer by John F. Pearne to Interrogatory 7 of the Foundation defendant.

GROUND: The claims of the patent embrace and purport to cover more than that which is disclosed therein as the alleged invention of the patentees and more than they had a right to claim.

FACTS: See earlier answer by John F. Pearne to Interrogatory 8 of the Foundation, incorporating answer to Interrogatory 7 by reference.

III. Carrel et al. Patent No. 3,150,376

GROUND: The alleged invention described and claimed was described in a printed publication more than one year prior to the effective filing date of the patent.

FACTS: Vital facts not yet known to plaintiffs are still under investigation and, hence, no decision has yet been made to rely at the trial on this ground.

GROUND: The alleged invention described and claimed was in public use and on sale in the United States more than one year prior to the effective filing date of the patent.

FACTS: The factual basis for this ground is that, as to claims 1, 2, 5, 6, 7, 11, 13, 15, and 16, the alleged invention of the claims was on sale in the United States in 1955 in the form of television antennas manufactured by Kay Townes Antenna Company of Rome, Georgia, and was in public use by its customers (none having yet been identified) in 1955, one of the antennas being known by the trademark "SUPER REAR GUARD" (item 7 of the prior art previously disclosed and described).

GROUND: Alleged invention described and claimed was described in a patent granted on an application for patent by another filed in the United States before the invention or discovery thereof by the patentees.

FACTS: Vital facts not yet known to plaintiffs are still under investigation and, hence, no decision has yet been made to rely at the trial on this ground.

GROUND: The patentee named in the patent did not himself invent the alleged invention described and claimed therein.

FACTS: Vital facts not yet known to plaintiffs are still under investigation and, hence, no decision has yet been made to rely at the trial on this ground.

GROUND: The alleged invention described and claimed in the patent was such that the differences between the subject matter thereof and the prior art would have been obvious, at the time the alleged invention was made, to a person having ordinary skill in the art to which said subject matter pertains.

FACTS: The factual basis for this ground is that said differences would have been obvious, as asserted, in view of the state of the art as illustrated by previously disclosed prior art items 1 to 20, inclusive, indicating the obviousness of and disclosing the expected results of Veeing dipole arms forwardly in a wide variety of types of antennas, including various multiple dipole endfire arrays, and of arranging a plurality of substantially coplanar elements of an endfire array in a plurality of zones;

and by the following additional items of prior art disclosing basic log periodic arrays:

Dwight E. Isbell
"Log Periodic Dipole Arrays"
Antenna Laboratory
Technical Report No. 39
University of Illinois
Published at least by September 21, 1959

"Research Studies on Problems
Related to ECM Antennas"
Quarterly Engineering Report No. 2
Antenna Section
Electrical Engineering Research Laboratory
University of Illinois
Published at least by May, 1959

GROUND: The claims of the patent do not particularly point out and distinctly claim the subject matter sought to be patented.

FACTS: See earlier answer by John F. Pearne to Interrogatory 21 of the Foundation defendant.

GROUND: The claims of the patent embrace and purport to cover more than that which is disclosed therein as the alleged invention of the patentees and more than they had a right to claim.

FACTS: See earlier answer by John F. Pearne to Interrogatory 22 of the Foundation defendant (incorporating, by reference, his answer to Interrogatory 21 of the Foundation defendant).

INTERROGATORY 1(b)-(e)

1. Referring to paragraphs 13 through 16 of plaintiff's Complaint:

(b) List and identify all documents, known to plaintiff, which are pertinent to said contention;

(c) Indicate the location of each document listed in answer to subparagraph (b) of this interrogatory;

(d) Give the names and addresses of all persons having custody and/or control of each document referred to in answer to subparagraphs (b) and (c) of this interrogatory;

(e) Give the names and addresses of all persons, known to plaintiff, having knowledge which bears on said contention.

Answer (By John F. Pearne)

(b) The documents inquired about comprise several types, as follows:

1. Publications by the University of Illinois.
2. U. S. Patents
3. IRE National Convention Records
4. The patents in suit
5. Advertising and sales promotion leaflets and brochures of various antenna manufacturers.

(b) As to the publications of types 1-4, copies are obviously available to defendants from known sources. As to the

publications of type 5, copies have previously been supplied by plaintiffs to counsel for the Foundation defendant. As to all five types, plaintiffs' counsel also has copies.

(e) The following persons whose names and addresses have previously been given to defendants have knowledge which bears on said contentions:

John F. Pearne
Lewis H. Finneburgh, Jr.
Robert C. Kranek
Edward N. Nemeth

In addition, as regards the instances of prior sales and public use mentioned in answer to part (a) of this interrogatory, various as yet unidentified personnel of the named antenna concerns and customers of those concerns must have knowledge which bears on said contentions.

INTERROGATORIES 2-6

2. Referring to paragraph 13 of plaintiff's Complaint:

(a) As to each of the patents in suit, state each specific instance, known to plaintiff, of public use in this country of the invention described and claimed therein, which use occurred more than one year prior to the effective filing date of the patent;

(b) As to each said instance of public use in this country given in answer to subparagraph (a) of this interrogatory:

(ii) State the date and place of such use;

(iii) Describe the device used;

(iv) Give the name and address of the manufacturer of said device referred to in the answer to subparagraph (iii);

(v) List the names and addresses of all persons, known to plaintiff, having knowledge of each said instance of public use;

(vi) List and identify all documents, known to plaintiff, which contain any information relating to each said instance of public use;

(vii) Specify the location of each such document listed or identified in answer to subparagraph (vi) of this interrogatory;

(viii) Specify the names and addresses of all persons having custody and/or control of each of said documents referred to in answer to subparagraphs (vi) and/or (vii) of this interrogatory;

(ix) Identify all existing models, known to plaintiff, of the device used in each said instance of public use and specify the present location of each such model;

(x) Specify the names and addresses of all persons having custody and/or control of each such model referred to in answer to subparagraph (ix) of this interrogatory.

3. Referring to paragraph 13 of plaintiff's Complaint:

(a) As to each patent in suit, state each specific instance, known to plaintiff, of an offer for sale or an actual sale of the device disclosed and claimed therein, which offer for sale or actual sale occurred more than one year before the effective filing date of the patent;

(b) As to each instance of an offer for sale or actual sale given in answer to subparagraph (a) of this interrogatory:

(ii) State the date and place of each such offer for sale or actual sale;

(iii) Describe the device offered for sale or actually sold;

(iv) State the name and address of the seller and of the purchaser of the device in each particular instance;

(v) State the name and address of the manufacturer of the device offered for sale or actually sold;

(vi) List the names and addresses of all persons, known to plaintiff, having knowledge of each such offer for sale or actual sale;

(vii) List and identify all documents, known to plaintiff, which contain any information relative to each such offer for sale or actual sale;

(viii) Specify the location of each such document listed or identified in answer to subparagraph (vii) of this interrogatory;

(ix) Specify the names and addresses of all persons having custody and/or control of each of said documents referred to in answer to subparagraph (vii) of this interrogatory;

(x) Identify all existing models, known to plaintiff, of the device used in each said instance of an offer for sale or actual sale;

(xi) Specify the location of each said model referred to in answer to subparagraph (x) of this interrogatory;

(xii) Give the names and addresses of all persons having custody and/or control of each such model referred to in answer to subparagraph (x) of this interrogatory.

4. Referring to paragraph 13 of plaintiff's Complaint, alleging that the patentees of the patents in suit did not themselves invent the inventions thereof:

(a) State all facts, known to plaintiff, which allegedly support the contention that the patentees of the patents in suit did not invent the inventions described and claimed therein;

(b) State the names and addresses of all persons, known to plaintiff, having knowledge which bears on said contention;

(c) List and identify all documents, known to plaintiff, which are pertinent to said contention;

(d) Indicate the location of each document listed in answer to subparagraph (c) of this interrogatory;

(e) State the names and addresses of all persons having custody and/or control of each document referred to in answer to subparagraphs (c) and (d) of this interrogatory.

5. Referring to paragraph 13 of plaintiff's Complaint:

(a) Identify all publications (including the publisher and date of publication) and all patents (including the patent number, year of publication, and country in which the patent was granted), known to plaintiff, which describe the invention disclosed in each of the patents in suit, which, in the case of

publications, were published more than one year prior to the effective filing dates of the patents in suit or which, in the case of patents, were filed in the United States before the invention by the patentees of the patents in suit;

(b) As to each patent and each publication identified in subparagraph (a) of this interrogatory, identify the specific pages, the specific passages therein, and the specific figures thereof, if any, which describe or concern the subject matter of the inventions disclosed and claimed in the patents in suit, indicating to which of the patents in suit each such identified patent, publication, passage, and/or figure is pertinent.

6. Referring to paragraph 14 of plaintiff's Complaint:

(a) Specify, with respect to each patent in suit, the prior art on which plaintiff relies to establish its contention that the differences between said prior art and the inventions described and claimed in the patents in suit would have been obvious to one skilled in the art at the time the inventions were made;

(b) List and identify all documents, other than those specified in subparagraph (a) of this interrogatory, which are pertinent to said contention;

(c) Indicate the location of each document listed in answer to subparagraphs (a) and (b) of this interrogatory;

(d) List the names and addresses of all persons having custody and/or control of each document referred to in answer to subparagraphs (a) and (b) of this interrogatory;

(e) Specify the name and address of each person, known to plaintiff, who has knowledge which bears on said contention.

Answers (By John F. Pearne)

To the extent that the requested information is known, it has been given above in the answers to the several parts of Interrogatory 1.

INTERROGATORIES 16-20

16. Referring to paragraph 12 of Plaintiff's Second Amended Complaint:

(a) As to Patent No. 3,210,767 in suit, state each specific instance, known to plaintiff, of public use in this country of the invention described and claimed therein, which use occurred more than one year prior to the effective filing date of the patent;

(b) As to each said instance of public use in this country given in answer to subparagraph (a) of this interrogatory:

(ii) State the date and place of such use;

(iii) Describe the device used;

(iv) Give the name and address of the manufacturer of said device referred to in the answer to subparagraph (iii);

(v) List the names and addresses of all persons, known to plaintiff, having knowledge of each said instance of public use;

(vi) List and identify all documents, known to plaintiff, which contain any information relating to each said instance of public use;

(vii) Specify the location of each such document listed or identified in answer to subparagraph (vi) of this interrogatory;

(viii) Specify the names and addresses of all persons having custody and/or control of each of said documents referred to in answer to subparagraphs (vi) and/or (vii) of this interrogatory;

(ix) Identify all existing models, known to plaintiff, of the device used in each said instance of public use and specify the present location of each such model;

(x) Specify the names and addresses of all persons having custody and/or control of each such model referred to in answer to subparagraph (ix) of this interrogatory.

17. Referring to paragraph 12 of Plaintiff's Second Amended Complaint:

(a) As to Patent No. 3,210,767 in suit, state each specific instance, known to plaintiff, of an offer for sale or an actual sale of the device disclosed and claimed therein, which offer for sale or actual sale occurred more than one year before the effective filing date of the patent;

(b) As to each instance of an offer for sale or actual sale given in answer to subparagraph (a) of this interrogatory:

(ii) State the date and place of each such offer for sale or actual sale;

(iii) Describe the device offered for sale or actually sold;

(iv) State the name and address of the seller or offerer and of the purchaser of the device in each particular instance;

(v) State the name and address of the manufacturer of the device offered for sale or actually sold;

(vi) List the names and addresses of all persons, known to plaintiff, having knowledge of each such offer for sale or actual sale;

(vii) List and identify all documents, known to plaintiff, which contain any information relative to each such offer for sale or adtual sale;

(viii) Specify the location of each such document listed or identified in answer to subparagraph (vii) of this interrogatory;

(ix) Specify the names and addresses of all persons having custody and/or control of each of said documents referred to in answer to subparagraph (vii) of this interrogatory;

(x) Identify all existing models, known to plaintiff, of the device used in each said instance of an offer for sale or actual sale;

(xi) Specify the location of each said model referred to in answer to subparagraph (x) of this interrogatory;

(xii) Give the names and addresses of all persons having custody and/or control of each such model referred to in answer to subparagraph (x) of this interrogatory.

18. Referring to paragraph 12 of Plaintiff's Second Amended Complaint:

(a) State all facts known to plaintiff which allegedly support the contention that the patentee of Patent No. 3,210,767 in suit did not invent the invention described and claimed therein;

(b) State the names and addresses of all persons, known to plaintiff, having knowledge which bears on said contention;

(c) List and identify all documents, known to plaintiff, which are pertinent to said contention;

(d) Indicate the location of each document listed in answer to subparagraph (c) of this interrogatory;

(e) State the names and addresses of all persons having custody and/or control of each document referred to in answer to subparagraphs (c) and (d) of this interrogatory.

19. Referring to paragraph 12 of Plaintiff's Second Amended Complaint:

(a) Identify all publications (including the publisher and date of publication) and all patents (including the patent number, year of publication, and country in which the patent was granted), known to plaintiff, which describe the invention disclosed

in Patent No. 3,210,767 in suit, and which, in the case of publications, were published more than one year prior to the effective filing dates of said patent in suit or which, in the case of patents, were filed in the United States before the invention by the patentee of said patent in suit;

(b) As to each patent and each publication identified in subparagraph (a) of this interrogatory, identify the specific pages, the specific passages therein, and the specific figures thereof, if any, which describe or concern the subject matter of the invention disclosed and claimed in Patent No. 3,210,767 in suit.

20. Referring to paragraph 13 of Plaintiff's Second Amended Complaint:

(a) Specify, with respect to Patent No. 3,210,767 in suit, the prior art on which plaintiff relies to establish its contention that the differences between said prior art and the invention described and claimed in said patent in suit would have been obvious to one skilled in the art at the time the invention was made;

(b) List and identify all documents, other than those specified in subparagraph (a) of this

interrogatory, which are pertinent to said contention;

(c) Indicate the location of each document listed in answer to subparagraphs (a) and (b) of this interrogatory;

(d) List the names and addresses of all persons having custody and/or control of each document referred to in answer to subparagraphs (a) and (b) of this interrogatory;

(e) Specify the name and address of each person, known to plaintiff, who has knowledge which bears on said contention.

Answers (By John F. Pearne)

To the extent that the requested information is known, it has been given above in the answers to the several parts of Interrogatory 1.

John F. Pearne

STATE OF OHIO)
COUNTY OF CUYAHOGA) SS:

John F. Pearne, who signed the foregoing answers to interrogatories, being duly sworn by me, deposed and said that the answers given by him are true to the best of his knowledge and belief.

Elizabeth J. Plumb
Notary Public

ELIZABETH J. PLUMB, Notary Public
My Commission Expires Feb. 14, 1969

CERTIFICATE OF SERVICE

A copy of the foregoing "ADDITIONAL ANSWERS BY PLAINTIFF, THE FINNEY COMPANY, TO ADDITIONAL INTERROGATORIES UNDER RULE 33 FILED BY DEFENDANT, THE UNIVERSITY OF ILLINOIS FOUNDATION" was served on each of defendants, The University of Illinois Foundation and JFD Electronics Corporation this 10th day of February, 1966, by mailing a copy, postage prepaid, to

I. Irving Silverman, Esq.
Silverman & Cass
105 West Adams Street
Chicago, Illinois 60603

and

Basil P. Mann, Esq.
Merriam, Marshall, Shapiro & Klose
30 West Monroe Street
Chicago, Illinois 60603

One of the attorneys for plaintiffs

Filed February 11, 1966

JFD Electronics has a nationwide organization of dealers and distributors. Listed below are the wholesale distributors serving dealers in Massachusetts.

Boston	Gerber Radio	1900 Columbus
Boston	O'Donnell Elect. Supply	1113 Commonwealth Ave.
Boston	Radio Shack Corp.	730 Commonwealth Ave.
Brockton	Ware Radio Supply	913 Centre St.
Boston	DeMambro Radio Supply	1095 Commonwealth Ave.
Holyoke	KTC Electronics	462 High St.
Lynn	Land Electronics	45 Sutton St.
Natick	Durrell Electronics	136 Worchester Rd.
New Bedford	C.E. Beckman	11-35 Commercial St.
Springfield	Del Padre Supply	999 Worthington St.
Springfield	Sydlee Electronics	453 Worthington St.
Waltham	Durrell Electronics	922 Main St.
Worcester	Johnson Electronic	12 E. Worcester St.

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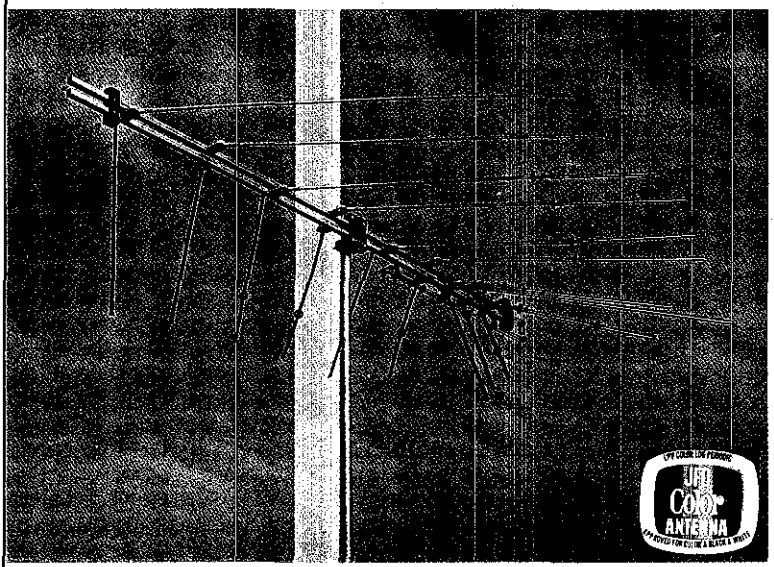
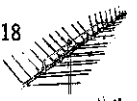
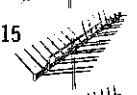


model LPV-VU18
Far-Fringe
$69.95



model LPV-VU15
Fringe
$59.95



model LPV-VU12
Near-Fringe
$49.95

model LPV—VU9
Suburban-Fringe
$39.50

model LPV-VU6
Metro-Suburban
$27.50

model LPV-VU5
For City Use
$17.50

Now you can enjoy the best reception ever on any VHF, UHF or FM/Stereo station—from <u>one</u> antenna, using <u>one</u> down-lead—with the patented new JFD COLOR LPV Log Periodic.

Enjoy **clearer** reception on **every** channel—**color** or black/white. Install the powerful new JFD LPV Color Log Periodic—the advanced new space-age antenna discovery.

ADVERTISED IN LIFE

All of its elements (not just some as in other ordinary antennas) work together for peak picture power on channels 2 to 83—provide FM/Stereo, too. Scientific patented log periodic design (same as that of antennas used to track satellites through space) is the reason.

AMERICAN ASSOCIATION FOR BETTER TELEVISION RECEPTION MEMBER

Whether you want **more** channels, **better** color, or **clearer** black/white pictures, call your JFD LPV Color Log Periodic TV antenna dealer and see the remarkable difference.

JFD ELECTRONICS CORPORATION
15th Avenue at 62nd Street, Brooklyn, N.Y. 11219

JFD International, 64-14 Woodside Ave., Woodside, N.Y. 11377
JFD Canada, Ltd., 51 McCormack Street, Toronto, Ontario, Canada

Through the science of space technology

JFD® LPV®

COLOR LOG PERIODIC TV ANTENNA

Developed from research performed at the famous University of Illinois Antenna Research Laboratories. Brings you reception never before possible with other ordinary antennas!

on any channel COLOR or black and white

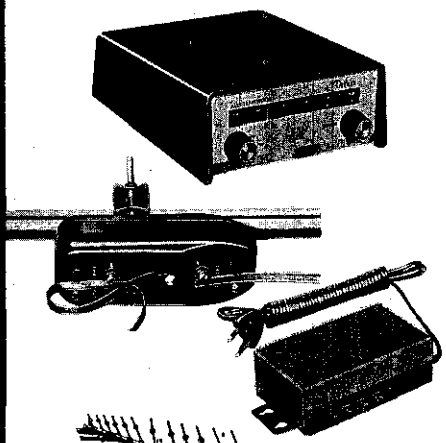
change this . . .

to this . . .

with this —

GET THE BEST *Color* PICTURES ON ANY CHANNEL 2 TO 83!

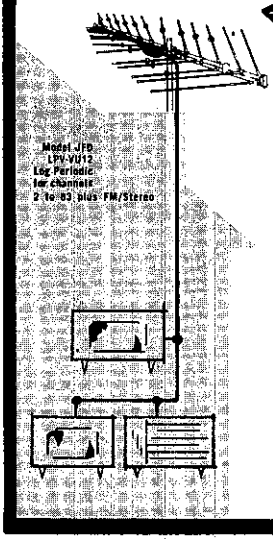
Rely on JFD accessories from antenna to TV set!...



UHF CONVERTER — Advanced all-transistor circuitry for highest reliability . . . finest performance. Exclusively illuminated slide rule fine-tuning. Beautiful "slim-line" styling.

model	description	list
CR2-J	2-Transistor and Diode	$39.95
CR1-J	1-Transistor and Diode	29.95

TELE-AMP ANTENNA AMPLIFIER— Strengthens any signal, clears up snow and interference. Completely transistorized. Mounts on any antenna crossarm. Feeds one or two sets.



SELECT A TELE-AMP MODEL TO FIT YOUR EXACT NEEDS

Tele-Amp Model VUT-3, 3-Transistor VHF/UHF TV—B/W & COLOR plus...F/M Stereo — **List Price $49.95**
Especially designed as companion to new JFD Model LPV-VU Antenna for a single system to deliver unprecendented power on all TV channels plus FM and FM Stereo.

Tele-Amp Model VN-2, 2-Nuvistor VHF TV, B/W & COLOR — **List Price $39.95**
Especially designed for metropolitan use to prevent strong local signals from ruining reception on desired channels. Shows **true picture improvement** where old fashioned pre-amps fail.

Tele-Amp Model VT-2, 2-Transistor — **List Price $39.95**
Two stages provide highest amplification. All solid-state reliability outlasts all other designs. Preferred by suburban TV viewers where there are only medium-strong local stations.

Tele-Amp Model VT-1, 1-Transistor VHF TV, B/W & COLOR Plus F/M Stereo — **List Price $34.95**

Tele-Amp Model VT-2-75, 2-Transistor VHF TV, 72 ohm coax cable B/W & COLOR, (Built-in FM Trap). — **List Price $44.95**

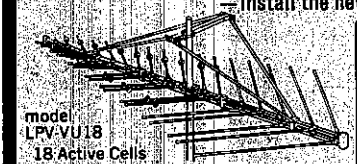
Tele-Amp model VUT-3TF, 3-Transistor UHF/VHF TV, B/W & COLOR, (Built-in FM Trap). — **List Price $49.95**
Preferred by suburban-fringe area TV viewers. Not recommended for use in strong signal areas.

Tele-Amp Model UHT-2, 2-Transistor UHF TV, B/W & COLOR — **List Price $44.95**
Clears up and brightens UHF stations. Solid-state reliability for years of trouble-free service.

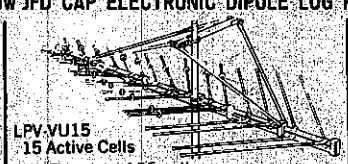
Tele-Amp Model FT-1, 1-Transistor FM & FM Stereo — **List Price $34.95**
Assures reception of 90% of all FM stations within 200 miles. Ideal for Stereo-multiplex. All solid-stage design requires no servicing, last for years.

IF YOU LIVE IN AN ALL-CHANNEL (2-83) VHF/UHF/FM STEREO LOCATION

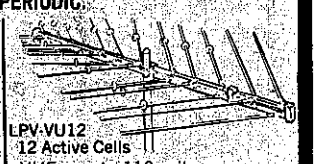
—install the new JFD CAP ELECTRONIC DIPOLE LOG PERIODIC.



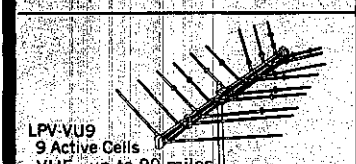
model LPV-VU18
18 Active Cells
VHF—up to 150 miles
UHF—up to 90 miles
FM—up to 75 miles
list $69.95



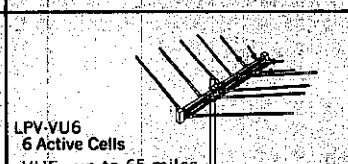
LPV-VU15
15 Active Cells
VHF—up to 125 miles
UHF—up to 90 miles
FM—up to 60 miles
list $59.95



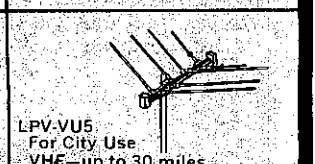
LPV-VU12
12 Active Cells
VHF—up to 110 miles
UHF—up to 50 miles
FM—up to 40 miles
list $49.95



LPV-VU9
9 Active Cells
VHF—up to 90 miles
UHF—up to 50 miles
FM—up to 40 miles
list $39.95



LPV-VU6
6 Active Cells
VHF—up to 65 miles
UHF—up to 40 miles
FM—up to 30 miles
list $27.50



LPV-VU5
For City Use
VHF—up to 30 miles
UHF—up to 20 miles
FM—up to 20 miles
list $17.50

LPV LOG PERIODIC TV ANTENNAS

JFD COLOR RECEPTION SPECIALIST

APPROVED FOR COLOR & BLACK & WHITE

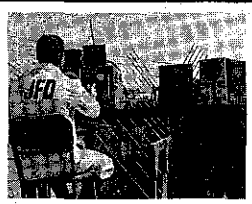
All-New JFD® LPV Log-Periodic* Antennas for the finest COLOR and black/white TV pictures on channels 2 to 83

* the Log-Periodic is a totally new and different antenna adapted by JFD from the famous satellite tracking antenna design of the Antenna Research Laboratories of the University of Illinois

Wherever you live... whichever channels you want... JFD has the LPV Log-Periodic antenna you need for clearer, sharper pictures in glowing COLOR—or black and white.

JFD LPV Log-Periodics are more powerful because *all* its elements (not just some elements, as in other antennas) work on the channels *you* want.

Check below for the JFD Log-Periodic especially engineered for the channels you want.



FOR "NORMAL" CHANNEL 7 TO 83 AREAS

Where stations are grouped close to each other—JFD UHF LPV LOG PERIODIC ANTENNAS.

Model LPV-U21

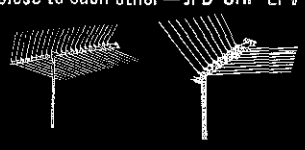
For deep fringe UHF areas **(up to 80 miles)** plus VHF channels 7 to 13. **$27.95,** list.

Outperforms 12-bay bowtie-reflector!

Model LPV-U9

For local-suburban UHF areas **(up to 40 miles)** plus VHF channels 7 to 13. **$12.50,** list.

Outperforms 4-bay bowtie-reflector!



Model LPV-U15

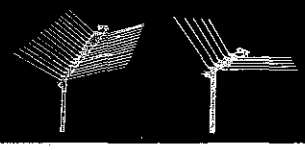
For fringe UHF areas **(up to 60 miles)** plus VHF channels 7 to 13. **$18.95,** list.

Outperforms 8-bay bowtie-reflector!

Model LPV-U5

For local UHF areas **(up to 25 miles)** plus VHF channels 7 to 13. **$6.95,** list.

Outperforms corner reflector!



FOR "PROBLEM" CHANNEL 14 TO 83 AREAS

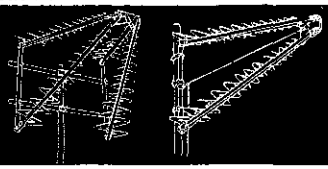
Where stations are not near each other--JFD UHF ZIG-A-LOG LOG PERIODIC TV ANTENNAS.

The new Zig-a-Log is based on one of science's newest approaches to microwave antenna design—the **vertically polarized Log-Periodic planar helical.**

As a result, the Zig-a-Log pulls in sharp pictures in weak signal areas . . . eliminates the need for a rotator in UHF areas where stations are located apart from each other.

Model LPV-ZU20

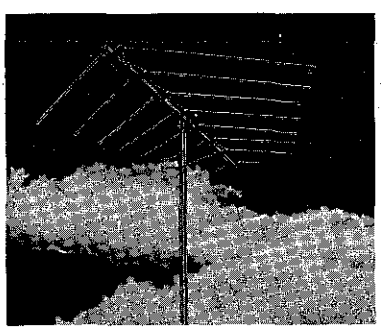
Outperforms parabolic arrays. Designed for areas requiring exceptionally high gain and directivity because of "snowy" and "ghosty" pictures—
up to 90 miles. $34.95, list.



Model LPV-ZU10

Outperforms 8-bay bowtie-reflector antennas. Works especially well in locations (without a rotator) where stations are up to 48 degrees apart —
up to 60 miles. $15.95, list.

-AND FOR THE BEST CHANNEL 2 TO 13 PICTURE IN SIGHT—COLOR, OR BLACK & WHITE—REPLACE YOUR OLD OBSOLETE VHF ANTENNA WITH THE—



LOG PERIODIC

JFD VHF LPV

Developed from research performed at the University of Illinois Antenna Research Laboratories, and adapted for TV by JFD—the **VHF** Log Periodic LPV brings you the best possible reception on channels 2 to 13, plus FM. The secret of its power is its patented design—the same as that used in antennas to track satellites through space.

Six VHF LPV Log Periodics to choose from—suit any location needs.

model	range	list
LPV4L	up to 50 miles	$14.95
LPV6L	up to 75 miles	21.95
LPV8L	up to 100 miles	29.95
LPV11L	up to 125 miles	39.95
LPV14L	up to 150 miles	49.95
LPV17L	up to 175 miles	59.95

LPV LOG PERIODIC TV ANTENNAS
JFD COLOR ANTENNA
APPROVED FOR COLOR & BLACK & WHITE

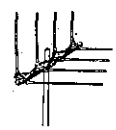
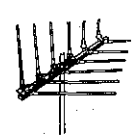
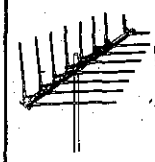
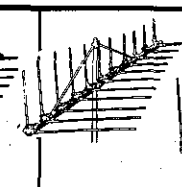
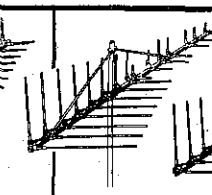
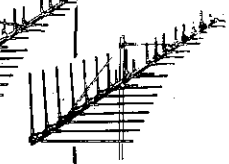
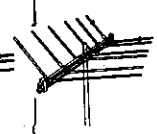
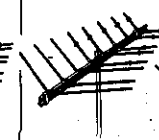
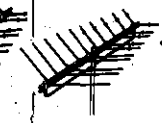
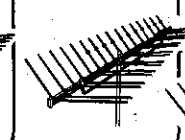
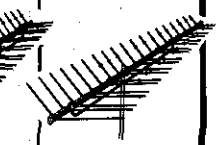
Form 730 Rev. Litho in U.S.A. 9-65

JFD® LPV Color LOG PERIODIC ANTENNA GUIDE

ADVERTISED IN LIFE

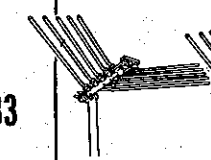
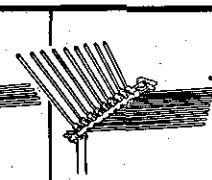
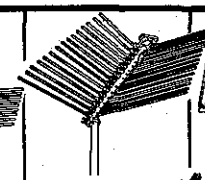
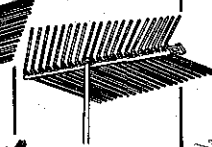
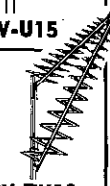
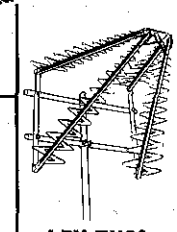
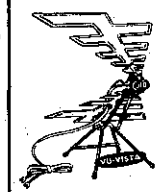
VHF channels 2-13

FOR VHF CHANNELS

	up to 50 miles	up to 75 miles	up to 100 miles	up to 125 miles	up to 150 miles	up to 175 miles
LPV-L COLOR Log Periodic for channels 2-13 plus FM	 LPV4L	 LPV6L	 LPV8L	 LPV11L	 LPV14L	 LPV17L
LPV TV COLOR Log Periodic for channels 2-13 plus FM	up to 50  LPV-TV3	up to 75  LPV-TV5	up to 100  LPV-TV7	up to 125  LPV-TV10	up to 150  LPV-TV13	up to 175  LPV-TV16	up to 200  LPV-TV19

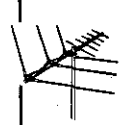
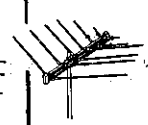
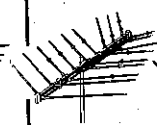
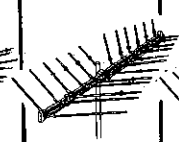
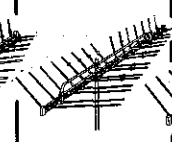
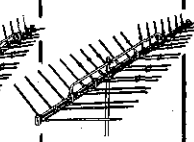
UHF channels 14 to 83

FOR UHF CHANNELS

	up to 25 miles	up to 40 miles	up to 60 miles	up to 80 miles	up to 90 miles	INDOOR UHF ANTENNA
LPV-U COLOR Log Periodic for channels 14 to 83 7-13	 LPV-U5	 LPV-U9	 LPV-U15	 LPV-U21		
LPV-ZU COLOR Log Periodic for channels 14 to 83			 LPV-ZU10		 LPV-ZU20	 LPT-100 TRAPEZOID

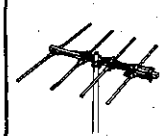
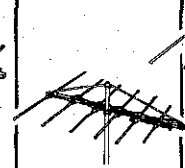
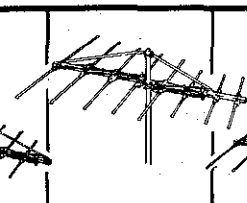
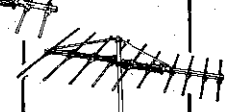
VHF-UHF channels 2 to 83

FOR VHF/UHF TV & FM/STEREO

	VHF—up to 30 miles UHF—up to 20 miles FM—up to 20 miles	VHF—up to 65 miles UHF—up to 40 miles FM—up to 30 miles	VHF—up to 90 miles UHF—up to 50 miles FM—up to 40 miles	VHF—up to 110 miles UHF—up to 70 miles FM—up to 40 miles	VHF—up to 125 miles UHF—up to 90 miles FM—up to 60 miles	VHF—up to 150 miles UHF—up to 90 miles FM—up to 75 miles	INDOOR VHF/UHF ANTENNA LPT-283 TRAPEZOID
LPV-VU COLOR Log Periodic for channels 2 to 83 & F/M Stereo	 LPV-VU5	 LPV-VU6	 LPV-VU9	 LPV-VU12	 LPV-VU15	 LPV-VU18	

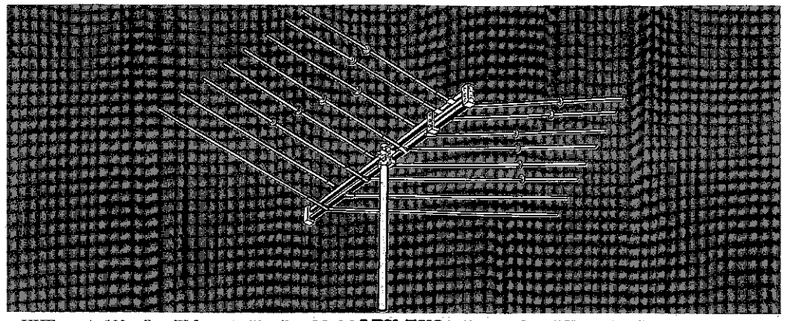
FM/STEREO

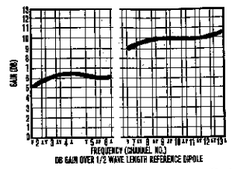
FM/STEREO

	up to 75 miles	up to 125 miles	up to 150 miles	up to 175 miles
LPL-FM COLOR Log Periodic for F/M Stereo frequencies 88-108 mc.	 LPL-FM4	 LPL-FM6	 LPL-FM8	 LPL-FM10

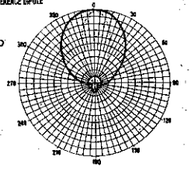
JFD ELECTRONICS CORPORATION 15th Avenue at 62nd Street, Brooklyn, N. Y. 11219

Form No. 893 Litho U. S. A.

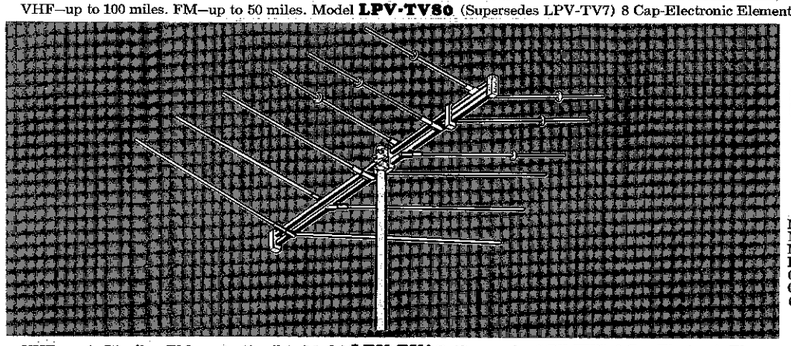


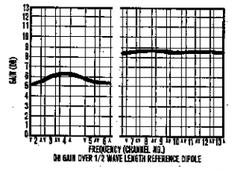


Median VSWR 1.7:1
Median F/B Ratio 14 db
Median ½ Power (E Plane) Beamwidth
Ch. 2-6: 76° ——
Ch. 7-13: 32° - - -
7 lbs.

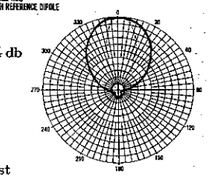


VHF—up to 100 miles. FM—up to 50 miles. Model **LPV-TV80** (Supersedes LPV-TV7) 8 Cap-Electronic Element System **$31.95** list

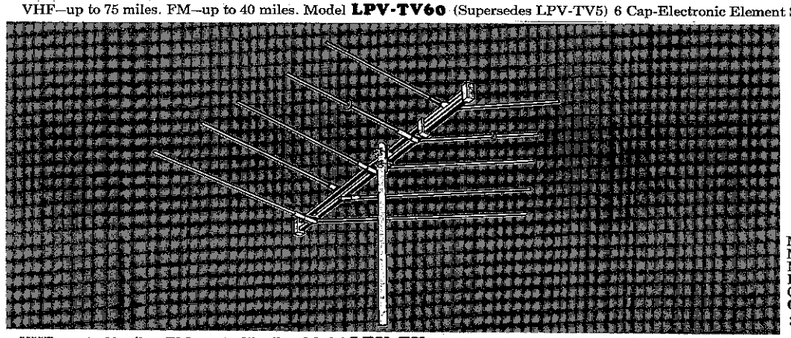


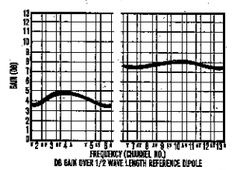


Median VSWR 1.7:1
Median F/B Ratio 14 db
Median ½ Power (E Plane) Beamwidth
Ch. 2-6: 78° ——
Ch. 7-13: 34° - - -
6 lbs.

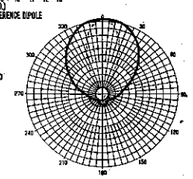


VHF—up to 75 miles. FM—up to 40 miles. Model **LPV-TV60** (Supersedes LPV-TV5) 6 Cap-Electronic Element System **$23.95** list

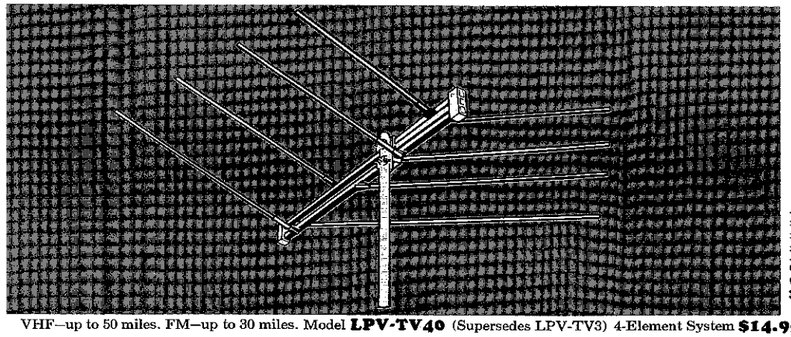


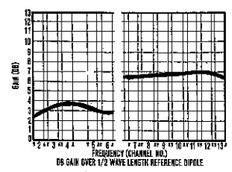


Median VSWR 2.0:1
Median F/B Ratio 14 db
Median ½ Power (E Plane) Beamwidth
Ch. 2-6: 79° ——
Ch. 7-13: 36° - - -
3½ lbs.

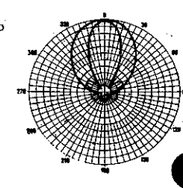


VHF—up to 60 miles. FM—up to 35 miles. Model **LPV-TV50** 5 Cap-Electronic Element System **$17.50** list





Median VSWR 2.0:1
Median F/B Ratio 14db
Median ½ Power (E Plane) Beamwidth
Ch. 2-6: 85° ——
Ch. 7-13: 38° - - -
3½ lbs.



VHF—up to 50 miles. FM—up to 30 miles. Model **LPV-TV40** (Supersedes LPV-TV3) 4-Element System **$14.95** list

JFD LPV COLOR TV/FM RECEPTION SPECIALIST

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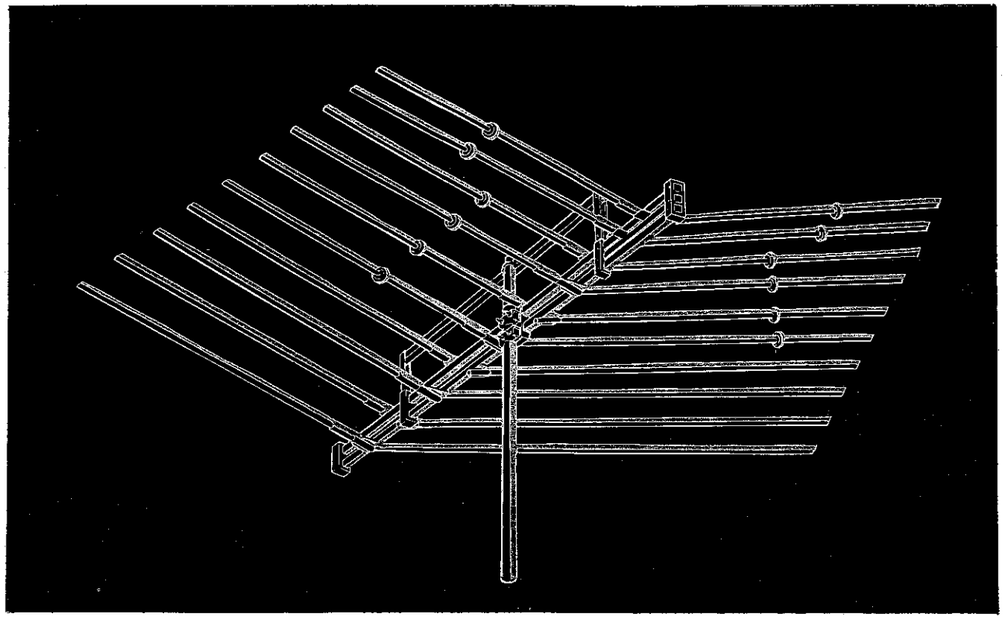


the advanced new

JFD®

LPV-TV COLOR LOG PERIODIC

For channels 2 to 13—in magnificent COLOR, better-than-ever black/white—plus FM/Stereo

- **NEW IMPROVED LOG PERIODIC DESIGN**
  Continuing research by the JFD Antenna Research Laboratories brings extra gain, extra color-sensitivity, extra efficiency to todays most popular VHF log periodic design.
- **INTEGRATED TRANSFORMER DESIGN**
  A new feature from JFD. Improved impedance match 300-OHM lead-in is obtained by unique construction which combines mechanical rigidity of twin and triple boom construction with superior electrical performance of a step-up transmission line transformer.
- **REACTANCE-LOADED DIPOLES**
  High band performance is enhanced by adjusting ratio of second-to-first resonant frequencies. More active dipoles produce narrower beams and higher gain.
- **CAPACITOR-LOADED DUAL-BAND DIRECTORS**
  Each and every director is optimally tuned to work on both low band and high band channels. Eliminates "lazy" elements which are effective on only one or two channels and may detract from overall performance on other channels.
- **NEW CYLINDRICAL CAPACITOR CONSTRUCTION**
  Precise control of capacitance is maintained even in mass-production since capacitance depends primarily upon length of rod insert. No capacitor plates to bend or wrap. No critical dimensions to maintain.

JFD®

LPV®-TV

COLOR

LOG PERIODIC

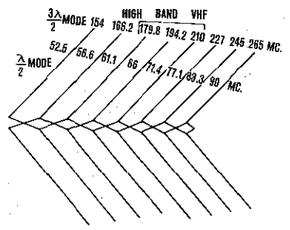


Figure 1.

Log Periodic Antenna without capacitor-coupled dipoles. Note that whereas each dipole has a fundamental resonant frequency in the low VHF band, only three of the eight dipoles have resonant frequencies in the high VHF band.

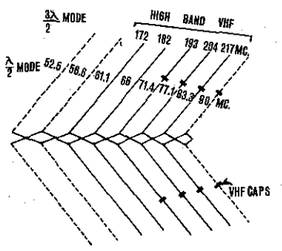


Figure 2.

Increased high band directivity and gain are obtained by adding capacitors of predetermined values at proper locations along the dipoles to shift their second resonance into the VHF (174 mc-216 mc) band. Five of the eight dipoles now resonate in the VHF band instead of the previous three.

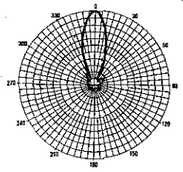


Figure 3.

Typical "E" Horizontal Plane Polar Pattern (channel 7-13)

□ **New capacitor-coupled Cap-Electronic** elements that respond on the third harmonic mode for highest effective gain. More harmonically resonant elements mean higher signal-to-noise ratios, better ghost rejection, sharper directivity on high VHF band—where it's most needed, especially in *color*.**

□ **Lo-impedance** twin-boom feeder that insures optimum impedance match to dipoles for increased signal transfer.

□ **Flat frequency response** (±½ db across any 6 mc channel) for studio-quality color regardless of channel tuned.

**NEW LPV-TV LOG PERIODIC ANTENNA SERIES

incorporates new capacitor-coupled element concept for improved response, especially in color, on channels 2 to 13.

The outstanding results of the original JFD LPV log periodic antenna series are well known to everyone who has used these picture-proved performers. We thought we couldn't improve on a winner but we have—through continued research and experimentation. The result of these efforts is a new Log Periodic antenna family—the LPV-TV—whose major innovation is the use of capacitor-coupled dipoles and directors which enhance third harmonic mode performance. By introducing unique parallel-plate capacitors into the elements and carefully adjusting their capacitance and location, JFD has created *more* driven elements, model for model, than those previously available in the original log periodic series.

In the original JFD Log Periodic series, the element lengths varied from those resonant on channel 6 (88 mc) to those resonant on channel 2 (54 mc). These same elements are resonant in the 3/2 wavelength mode at approximately three times the frequency. But the 3/2 wavelength mode frequencies of some of these dipoles falls *outside* of the usable VHF spectrum.

Fig. 1 shows how a VHF log periodic with eight conventional V-dipoles might look. The resonant frequencies of the dipole elements in the low VHF band are indicated near midpoint of each dipole. The 3/2 wavelength resonant frequencies are indicated near the ends of each dipole. (Note that only *three* dipoles resonate at frequencies in the high VHF band.)

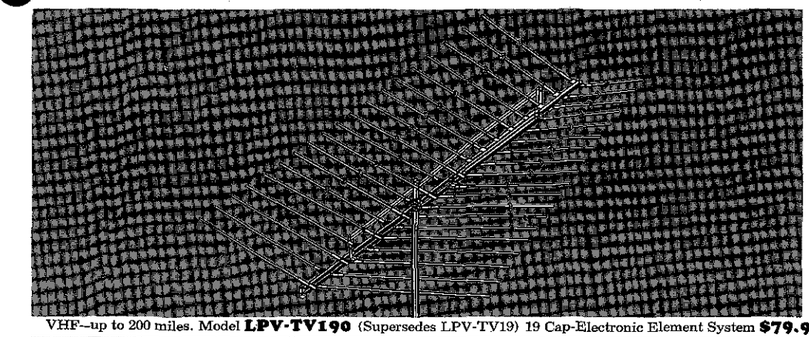
However, by introducing parallel-plate capacitors into the dipoles and by carefully adjusting the value of this capacitance and its position on the dipole, as shown in Figure 2, the resonant frequencies of two of the dipoles can be shifted in the 3/2 wavelength mode. In this way, the dipoles can be made to resonate at 204-217 mc as well as at 83.3-90 mc.

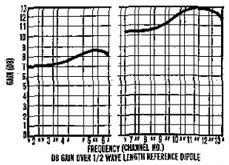
Result: the active region in the high band includes *five* of the eight original dipoles instead of three, as in Fig. 2, with performance improvement of 66⅔ percent. Low-band performance is also improved, because there is no longer any need to compromise low-band design in advance to accommodate high-band performance. Capacitor-coupling has also made possible dual-band directors that can be accurately tuned for narrower beamwidths and more gain on channels 2 to 6, then accurately and independently retuned for the same characteristics on channels 7 to 13. The new **capacitor-coupled** LPV-TV Log Periodic not only offers *higher* and *more* uniform gain in both the high and low bands, but also *lower* side lobe levels, *narrower* beamwidths and consequently *greatly improved* ghost rejection as evidenced in Fig. 3.

An additional feature of this new series is the use of new low impedance twin crossarms which function as a crossed feeder harness for maximum improved signal transfer on all VHF channels.

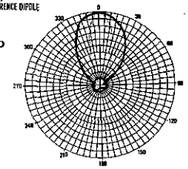
Eight LPV-TV models to choose from — meet any location or budget needs!

Don't be misled by "blue-sky" claims of log-periodic "look-alikes" or imitations. Only the JFD LPV with patented Log Periodic design, derived from research performed at the University of Illinois Antenna Research Laboratories, fully realizes the superb potential of this remarkable Log Periodic concept.

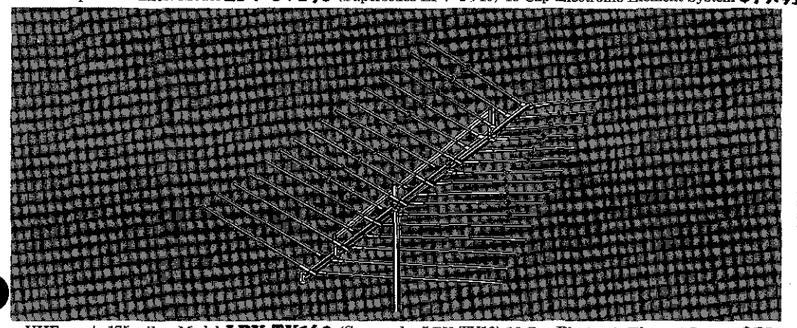


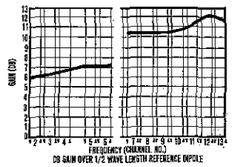


Median VSWR 1.4:1
Median F/B Ratio 14 db
Median ½ Power (E Plane) Beamwidth
Ch. 2-6: 55°
Ch. 7-13: 24°
19 lbs.

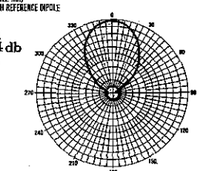


VHF—up to 200 miles. Model **LPV-TV190** (Supersedes LPV-TV19) 19 Cap-Electronic Element System **$79.95** list

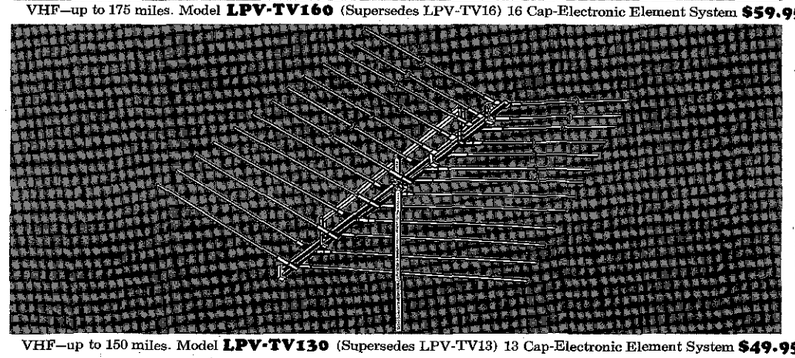


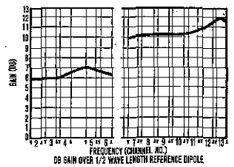


Median VSWR 1.4:1
Median F/B Ratio 14 db
Median ½ Power (E Plane) Beamwidth
Ch. 2-6: 60°
Ch. 7-13: 26°
16½ lbs.

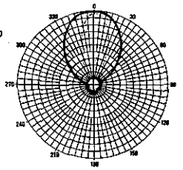


VHF—up to 175 miles. Model **LPV-TV160** (Supersedes LPV-TV16) 16 Cap-Electronic Element System **$59.95** list

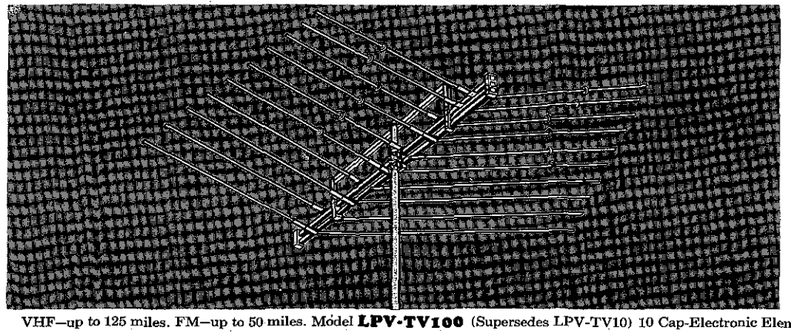


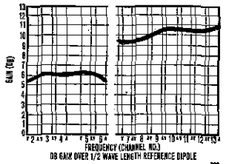


Median VSWR 1.6:1
Median F/B Ratio 14 db
Median ½ Power (E Plane) Beamwidth
Ch. 2-6: 69°
Ch. 7-13: 28°
14¼ lbs.

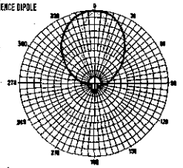


VHF—up to 150 miles. Model **LPV-TV130** (Supersedes LPV-TV13) 13 Cap-Electronic Element System **$49.95** list



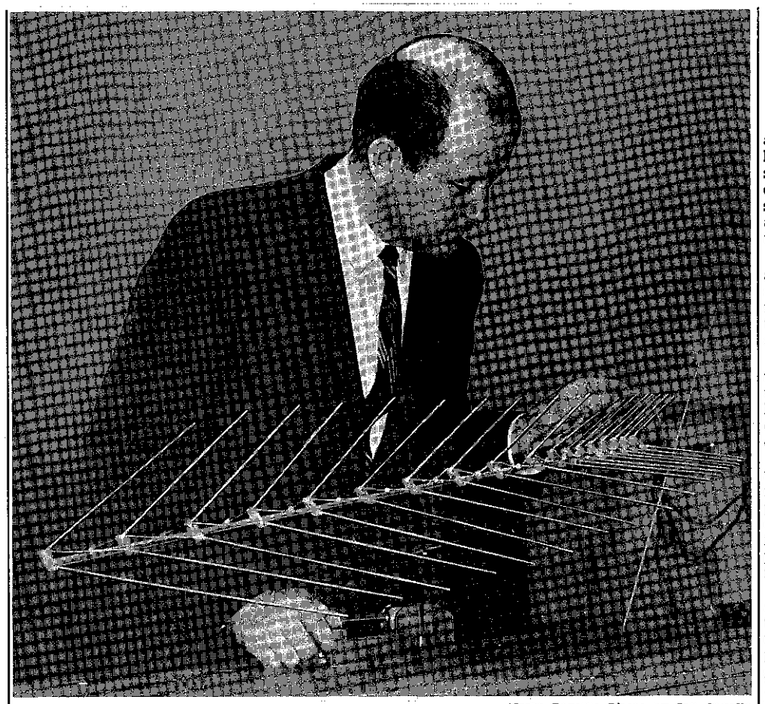


Median VSWR 1.6:1
Median F/B Ratio 14 db
Median ½ Power (E Plane) Beamwidth
Ch. 2-6: 73°
Ch. 7-13: 30°
11½ lbs.



VHF—up to 125 miles. FM—up to 50 miles. Model **LPV-TV100** (Supersedes LPV-TV10) 10 Cap-Electronic Element System **$41.95** list

REPRINTED FROM The News-Gazette Champaign Illinois THURSDAY, JULY 23, 1964



News-Gazette Photo by Ian Ingalls

Dr. Paul E. Mayes inspects and checks out one of log-periodic family.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

UI's Mayes, Team Develop Better TV Antennas

By HANK HOKAMP
News-Gazette Staff Writer

Remember how you used to shake and pound your radios, trying to "get the darn things" playing again? That was then ... but how about now?

Yes, you've found a new culprit to cuss and perhaps shake . . . and to top things off, it's usually the most popular piece of furniture in the house ... the television set.

Thanks to the efforts of such men as Dr. Paul E. Mayes, professor of electrical engineering at the University of Illinois, and his associates, this situation may well become a rarity instead of commonplace.

"For many years no attempt was made to achieve a constant pattern regarding the development of VHF, UHF, VHF-UHF, and FM antennas," Dr. Mayes said. "Today there exisits a need for antennas which will cover a number of isolated frequency bands rather than covering continuously the entire spectrum between the lowest and highest frequencies of interest," he said.

Dr. Mayes and his colleagues have done just this .. developed a number of TV antennas which are presently being sold to the consumer public by electronic parts companies throughout the nation.

Another series of antennas, this time a family of four designed for FM Stereo radios, were released for production July 1. These antennas were developed by Mayes and Ron Grant, chief engineer at the JFD Antenna Laboratories located at 714 So. Randolph, C.

The JFD Electronics Corporation, Brooklyn, N.Y., manufactures these antennas and is licensed by the UI Foundation. JFD extends exclusive rights to the UI Foundation for its patented log - periodic - antenna concept.

Regarding the TV antennas developed by Mayes and his associates the largest log-periodic antenna in this family is the JFD Log-Periodic LPV antenna. This antenna can conquer the super fringe area up to 175 miles from a transmitter. It's considered to be the best for color and black and white reception regarding the capabilities of the "family."

The smallest LPV antenna reaches out to 50 miles from the transmitter. This is all one needs to attain local reception.

The second antenna in this family is the LPV-U, or the first UHF antenna design based upon the patented LPV formula by the laboratories at the UI. This antenna is used for high band performance on channels 14 to 83. Four models are now available and range up to 80 miles regarding reception.

No commercial antenna has had uniform high gain over the complete VHF television band. The log-periodic V, the third antenna available in this series, takes care of this unique situation. Out of various experiments led by Prof. V. H. Rumsey and Prof. J. D. Dyson, both members of the electrical engineering department at the UI, this log spiral antenna became available.

What is called the strongest antenna developed for UHF is the Zig-A-Log antenna, a new concept for local or long distance reception on channel 14 to 83.

This Zig-A-Log antenna is said to offer much less wind resistance, much less ice and snow loading area, and better directive gain.

Log-periodic or logarithmic antennas make-up a family that have a unique fundamental design. These designs have been developed by Mayes and his associates since 1954 at the UI and include the presence of a three-fold purpose.

These antennas have been and are presently being used for satellite tracking at missile range locations at points along the Atlantic and Pacific Oceans as well as at Cape Kennedy.

Secondly, the log-periodic antennas are used by communication networks of the Armed Forces. These new type designs can be made to cover any range of frequencies.

The third use of the antennas are found in commercial circles mentioned before. The TV log-periodic antennas have been developed since 1954 with the four FM Stereo antennas to be placed on the market in the near future.

Where does this antenna research take place? Largely at the JFD Laboratories where 12 undergraduate, graduate and post-graduate students are engaged in this basic research in log-periodic type antennas for television, FM, amateur and military application.

The new JFD Antenna Laboratory is located in the Interstate Research. Park northwest of Champaign with the construction scheduled to be completed by Sept. 1. Operations at the new laboratory will not begin until Oct. 1. The facilities will be used for the development of new antenna designs for all-channel VHF and UHF reception.

According to a survey paper recently published by Profs. E. C. Jordan, G. A. Deschamps, J. D. Dyson and Mayes, it was noted that some of the earliest broadband antennas were long wire types designed to operate in the high frequency or shortwave band or perhaps in the low frequency band. Among these antennas the well - known rhombic or equilateral parallelogrammed shaped antenna has held a high place since the days of radio. The log-periodic antenna is a revolutionary development in design.

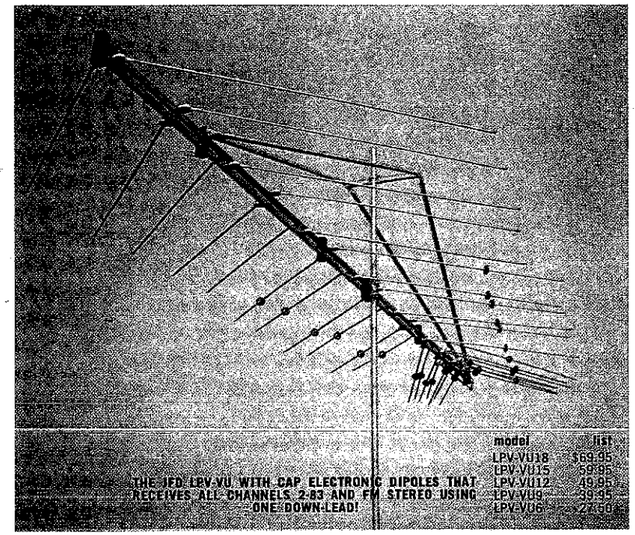
Other information gathered during the survey was presented for the express purpose of providing the nonspecialist with a basic understanding of the remarkable advances which have taken place over the past decade in the field of broadband antennas.

Since the law now requires all TV sets to come from the factory with a UHF "hook-up", perhaps this need for antennas to cover a number of isolated frequency bands could open more interesting doors to interested parties such as Dr. Mayes and his associates.

Form No. 896 Litho in U. S. A. 3-65

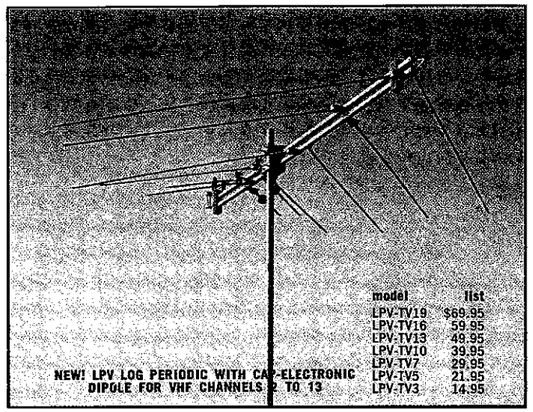
Don't Be 1/2 Set... With JFD LPV Log

Be All Set— Periodic TV & FM Antennas



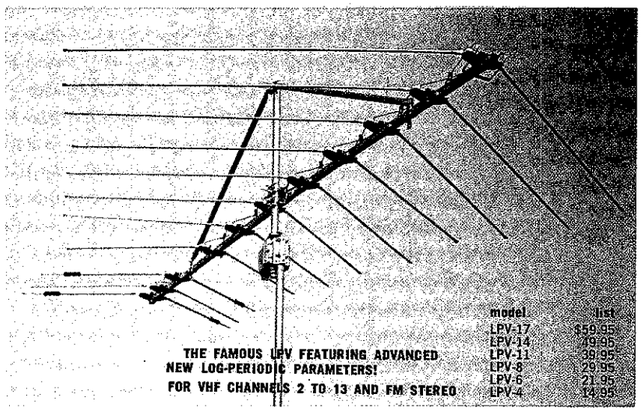
model	list
LPV-VU18	$69.95
LPV-VU15	59.95
LPV-VU12	49.95
LPV-VU9	39.95
LPV-VU6	29.95

THE JFD LPV-VU WITH CAP ELECTRONIC DIPOLES THAT RECEIVES ALL CHANNELS 2-83 AND FM STEREO USING ONE DOWN-LEAD!



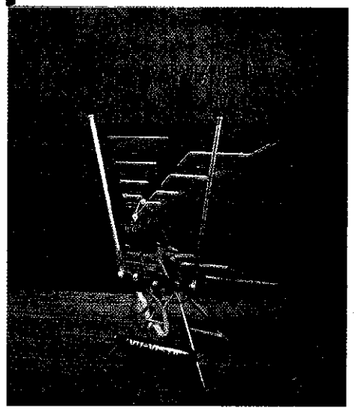
model	list
LPV-TV19	$69.95
LPV-TV16	59.95
LPV-TV13	49.95
LPV-TV10	39.95
LPV-TV7	29.95
LPV-TV5	21.95
LPV-TV3	14.95

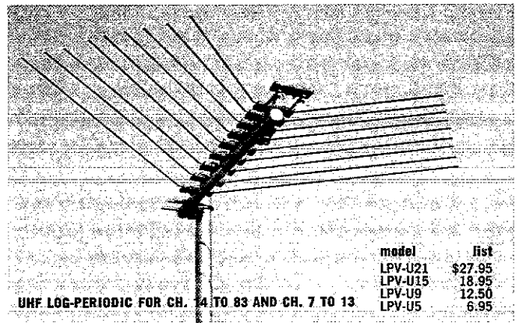
NEW! LPV LOG PERIODIC WITH CAP ELECTRONIC DIPOLE FOR VHF CHANNELS 2 TO 13



model	list
LPV-17	$59.95
LPV-14	49.95
LPV-11	39.95
LPV-8	29.95
LPV-6	21.95
LPV-4	14.95

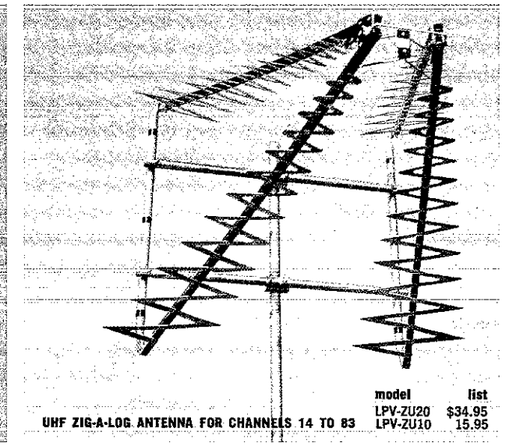
THE FAMOUS LPV FEATURING ADVANCED NEW LOG-PERIODIC PARAMETERS! FOR VHF CHANNELS 2 TO 13 AND FM STEREO





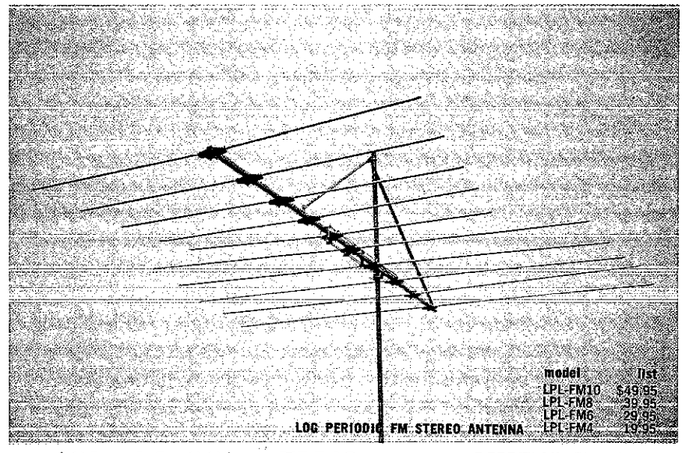
model	list
LPV-U21	$27.95
LPV-U15	18.95
LPV-U9	12.50
LPV-U5	6.95

UHF LOG-PERIODIC FOR CH. 14 TO 83 AND CH. 7 TO 13



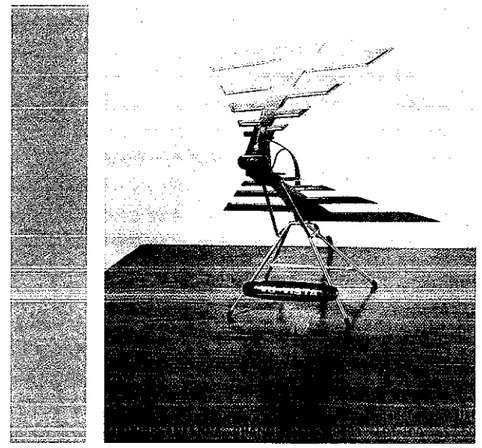
model	list
LPV-ZU20	$34.95
LPV-ZU10	15.95

UHF ZIG-A-LOG ANTENNA FOR CHANNELS 14 TO 83



model	list
LPL-FM10	$49.95
LPL-FM8	39.95
LPL-FM6	29.95
LPL-FM4	19.95

LOG PERIODIC FM STEREO ANTENNA



Only JFD offers You LPV Log Periodics for VHF (Ch.2-13)...UHF (Ch. 14-83)...FM/Stereo...VHF/UHF/FM-C LO & Black/White

GET THE LION'S SHARE OF ANTENNA BUSINESS (FLATTEN CATV COMPETITION, TOO) BY FEATURING THE JFD LPV-VU LOG PERIODIC! THIS NEW GENERATION OF LOG PERIODIC ANTENNAS DELIVERS WHAT VIEWERS WANT—MANY MORE STATIONS...VHF CHANNELS 2 TO 13...UHF CHANNELS 14 TO 83...FM/STEREO. GIVES THE CLEAN, UNIFORM SIGNAL SETS NEED ESPECIALLY FOR VIVID COLOR RECEPTION.

Only the LPV follows the patented **frequency independent Log Periodic** antenna formula developed by the Antenna Research Laboratories of the University of Illinois. This new log periodic cellular concept provides you with a combination of gain, bandwidth, directivity and impedance match never before possible with conventional antenna designs.

You can actually see the difference in **truer** color purity, in **greater** contrast, in **finer** detail—not on just some of the channels but **all** of the channels! **Small wonder more JFD Log Periodics were installed in the last 12 months than any other brand.**

PREFERRED BY MORE N. Y. WORLD'S FAIR PAVILIONS . . . New York World's Fair exhibitors demand flawless color reception. That's why the House of Good Taste, Masonic Pavilion, Formica House, Eastman Kodak Exhibit, New York City Exhibit, House of Japan and other Fair showplaces chose the JFD LPV. This exclusive preference is pre-selling millions of Fairgoers—opening the door for more LPV sales by you.

WHY THE LOG PERIODIC IS THE MOST DRAMATIC BREAK WITH ANTENNA TRADITION SINCE DR. YAGI INVENTED THE YAGI . . . Up until the JFD Log Periodic, it was not possible to devise a truly broadband antenna except by "compromise" design that had to give up vital gain to get wider bandwidth . . . or had to degrade directivity for better impedance. Burdensome parasitics were piled on to try to compensate for gain "suck-outs", ghost-prone polar patterns, and inadequate bandwidth. This pyramided performance complications resulting in signal-sapping standing waves and impedance matches—and yet were only effective at the band edges.

Through the use of the revolutionary new logarithmic periodic formula, the entire frequency range is covered with dipole groups (cells) of overlapping resonances. These harmonically resonant V-dipoles result in a **frequency-independent** performance. **The LPV's inherently high gain, sharp directivity, 300 ohm impedance match and flat response are virtually constant across the entire band.**

AND ONLY THE JFD LPV HAS IT! . . . The JFD LPV is the product of the world's largest and newest antenna laboratories. Here, in the JFD Champaign, Illinois R & D Research Center, a team of scientists and engineers, under the direction of Dr. Paul E. Mayes, are revolutionizing the state of the antenna art.

MECHANICALLY SUPERIOR! . . . COMPARE CONSTRUCTION! . . . Life-time stainless-steel take-off terminals that can never corrode, "tank-turret" element brackets, tough heavy-wall Implex A acrylic insulators, twin U-bolts with 6 inch mast grip span; supple, permanently riveted aluminum drive line rod; electrically conductive gold alodizing; plus a host of other exclusive mechanical improvements.

FIGHT CATV WITH THE JFD LPV! Keep CATV out of your area with JFD Log Periodics (such as the 82-channel LPV-VU) which provide viewers with more channels—sharper reception—richer color—plus FM stereo. Don't install inferior antennas that open the door to CATV. **Install the best to get the best performance—the LPV!**

ADVERTISED IN LOOK, SUNSET . . . COMPARE ADVERTISING AND PROMOTION! . . . A versatile selection of indoor and outdoor sales helps . . . advertisements in LOOK, SUNSET and other national and local consumer publications . . . in newspapers . . . on television . . . sell your best prospects.

Now is the time and your JFD distributor is the place to stock up and step up into big-league LPV Log Periodic profits.

SEE WHY AT THE MOMENT OF TRUTH THE PICTURE IS THE PROOF THE JFD LPV LOG PERIODIC WORKS BEST!

JFD ELECTRONICS CORPORATION
15th Avenue at 62nd Street, Brooklyn, N. Y. 11219
JFD Electronics-Southern Inc., Oxford, North Carolina
JFD International, 64-14 Woodside Ave., Woodside 77, N. Y.
JFD Canada, Ltd., 51 McCormack Street, Toronto, Ontario, Canada

Report No. 2

ANTENNA LABORATORY

Quarterly Engineering Report

RESEARCH STUDIES ON PROBLEMS RELATED TO ECM ANTENNAS

This report is not to be announced or distributed automatically, in accordance with AFR 205-43A, Paragraph 6d.

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