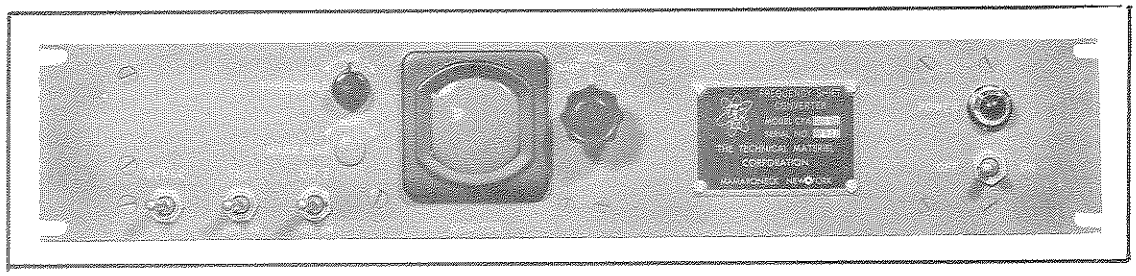
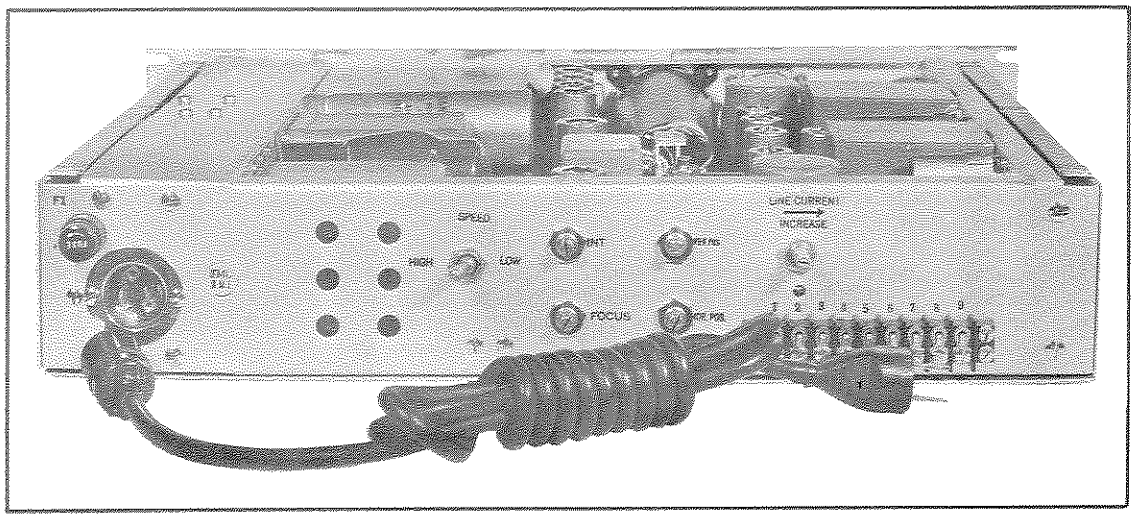
SALES SERVICE BULLETIN NUMBER 120

Model CFA Frequency Shift Converter



Front View



Rear View

The Model CFA Frequency Shift Converter is a device used in radio-teletype frequency shift receiving systems to convert the "mark" and "space" tones from the output of the receivers in a diversity system into DC pulses capable of operating a teletypewriter, tape recorder or any other device requiring make and break input signals. The CFA is an audio type dual channel converter for use with diversity or single receiver systems.

The CFA was designed to provide maximum circuit efficiency with a minimum of operator effort and skill. Particular attention was given the mechancal layout of the equipment to provide a small, compact unit with all of the componants easily accessible for maintenance. The entire equipment is mounted on $3\frac{1}{2}$" panel to conserve much needed rack space.

Overall efficiency of converter techniques were improved by the incorporation of the following circuits and features:

1. Wide band limiter stages and newly designed discriminator circuits with superior transient response minimize the possibility of discriminator "ringing" common in other types of similar equipment under certain conditions of selective fading.

2. The CFA exploits every advantage inherent in frequency modulation systems.

Tests indicate that the limiter stages and de-emphasis networks remove all traces of amplitude modulation due to noise.

3. The application of DC clamping and a Two State Memory circuit provides automatic centering of the discriminator to eliminate the effects of the received carrier drifting up to 1500 cps. The CFA will continue to operate efficiently over a 1200 cps drift range when an 850 cps shift is being used, smaller input shifts correspondingly increase the drift range, so that the receivers need not be disturbed over long periods of time.

4. A Bias Correction Control enables the operator to correct for fixed "marking" or "spacing" bias of the received signal.

5. A Threshold Control minimizes the effect of noise during standby "marking" conditions.

6. An Automatic Mark-hold feature places the output circuit in "marking" condition during signal dropouts.

7. A "High/Low" Speed switch permits adjustment for normal teleprinter speeds or high speed multiplex signals.

8. In order to facilitate receiver tuning, a cathode ray type visual monitor is so connected as to permit extremely simple and rapid "setting-up on the signal being tuned. By observation of the visual monitor, the operator will know, not only when he is precisely at the discriminator center, but also in which direction he has drifted and may judge approximately how far off center he has drifted.

9. A Test Switch permits the operator to artificially throw the output circuit into Mark, Space or Line conditions as desired.

10. A newly developed all electronic output keying circuit operates exactly as neutral relay contacts. This circuit can be completely isolated from ground or either side may be grounded and is designed to operate into an external battery source similar to the TMC Model PSP Power Supply.

TECHNICAL SPECIFICATIONS

INPUT IMPEDANCE:	600 ohms .
INPUT LEVEL:	Minus 30 to plus 30 DBM.
INPUT LIMITING:	Between 50 to 60 db in each channel.
INPUT FREQUENCY SHIFT LIMITS:	100 to 1000 cps, centered about 2700 cps.
INPUT FREQUENCY DRIFT LIMITS:	$1\frac{1}{2}$ times maximum shift (1500) cps).
KEYING SPEEDS:	100 to 600 words per minute in High Speed Position. Up to 100 words per minute in Low Speed Position.
OUTPUT CIRCUIT:	Neutral, either side grounded or floating. 35 to 70 ma into 2000 ohm load with external battery similar to TMC Model PSP Power Supply. Smaller currents into higher load impedances.
TUNING INDICATOR:	Two inch cathode ray tube.
OPERATING CONTROLS:	Front Panel: 1. Primary Power Switch 2. Channel #1 On/Off Switch 3. Channel #2 On/Off Switch 4. Test Switch (Mark, Space, Line)

5. Threshold Control
6. Mark Bias Control
7. Monitor Scope Intensity Control
8. Monitor Scope Focus Control

} Covered Screwdriver adjustments

Rear Panel:

1. Sense Switch
2. Monitor Scope Centering Controls
3. Line Current Adjustment Control
4. Speed Switch
5. Pulse Restorer Adjustment Control

POWER REQUIREMENTS: 110/220 volts, plus or minus 10%, 50/60 cycles approx. 80 watts.

DIMENSIONS: $3\frac{1}{2}$'' high x 19'' wide x 16'' deep, including all rear panel controls.

MOUNTING: Standard 19'' WE relay rack.

SHIPPING WEIGHTS AND DIMENSIONS:

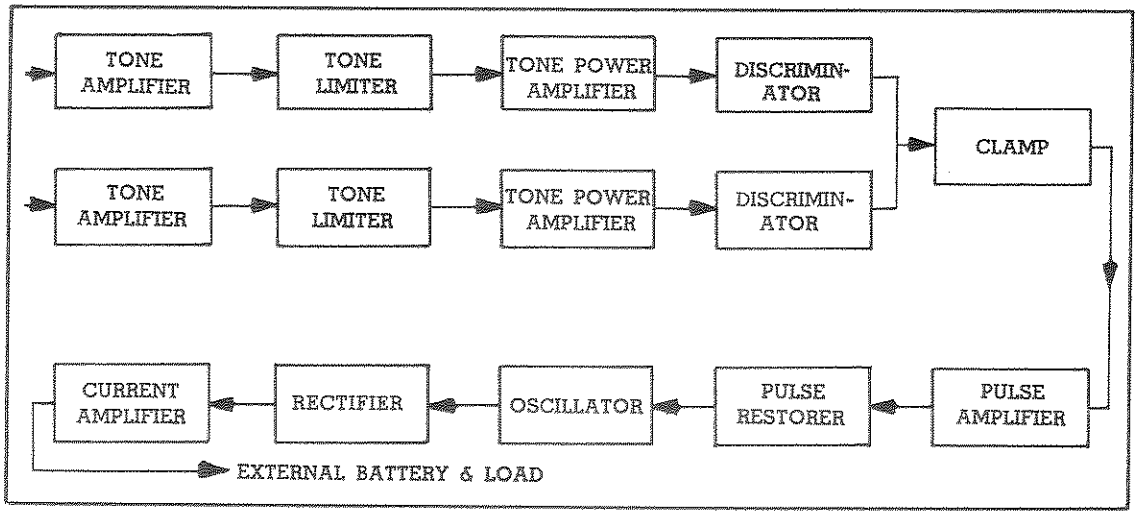
One carton approx. 38 lbs.
23 1/4'' x 21 1/4'' x 7 1/2'', domestic pack.

One case approx. 80 lbs.
31 1/4'' x 29 1/4'' x 15 1/2'', export pack.

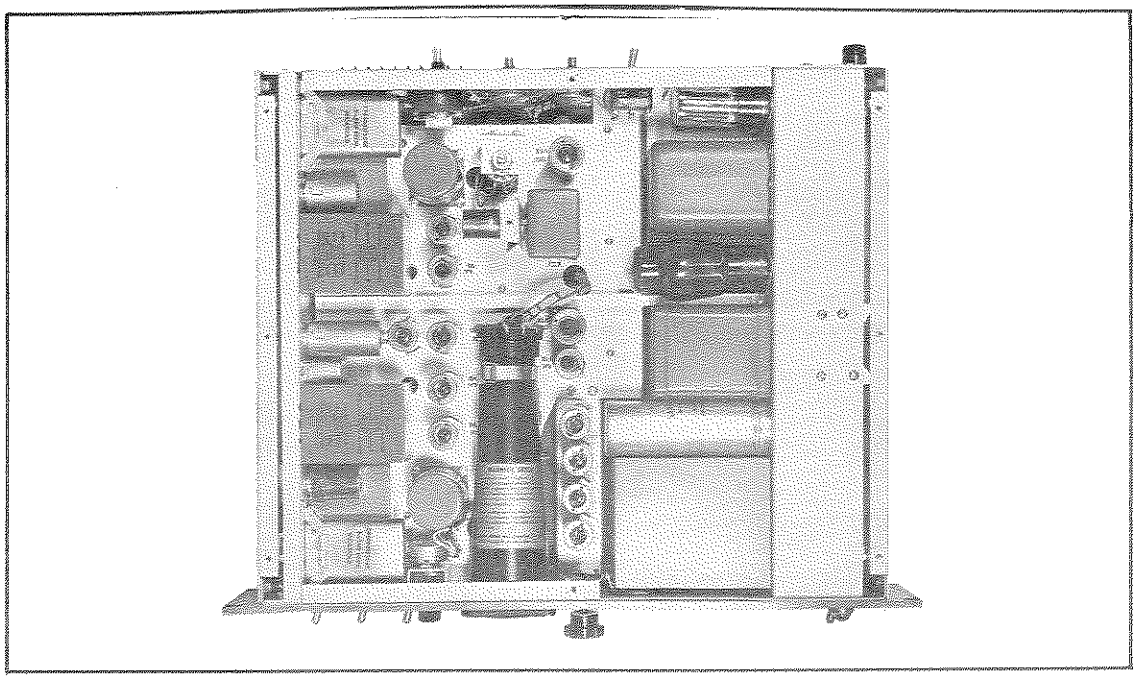
TUBE COMPLEMENT:
(All JAN miniature and octal Types.)

2 each 6AU6	Tone Amplifiers
2 each 6J6	Tone Limiters
1 each 12AU7	Tone power Amplifier
2 each 6AL5	Discriminator Rectifiers
2 each 6AL5	Clamp and Output Rectifier
2 each 6AU6	Pulse Amplifiers
1 each 12AU7	Monitor DC and AC Amplifier
1 each 6J6	Pulse Restorer
1 each 12AU7	Cathode Follower, Oscillator
1 each 6Y6G	Pulse Output
1 each 5Y3GT	Rectifier
1 each 6X4	Rectifier
3 each OB2	Regulators
1 each OA2	Regulator
1 each 2BP-1	Monitor

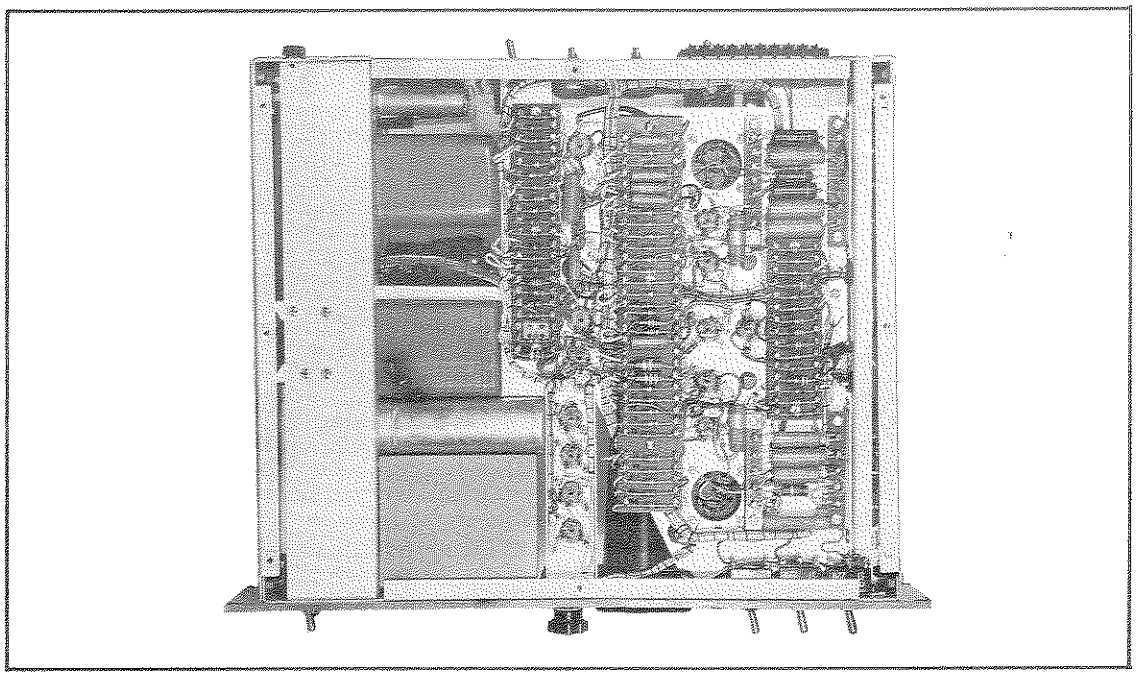
COMPONENTS AND CONSTRUCTION: JAN wherever practicable.



Functional Block Diagram - CFA Converter



Top View - Cover Removed



Bottom View - Cover Removed

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