

**NUMERICAL INDEX — DIVISION 410**

**TD-2 MICROWAVE RADIO**

**1. GENERAL**

- 1.01** This section provides an index of System-issued sections in Division 410.
- 1.02** This section reverted to Issue 1 in November 1974. Prior to that date there had been 99 issues of the section.
- 1.03** A bullet (●) indicates an item that has been added or changed since the previous issue of the index.
- 1.04** A square (□) indicates a canceled item. Information relating to the cancellation, if necessary, will be shown in a note following the item. Canceled items and related notes will be deleted upon reissue of the index.
- 1.05** A spade (♠) indicates an item not on microfiche. This index indicates the latest issue for hard-copy BSPs. In some cases, the microfiche BSP will reflect the next higher issue as a result of the reduced distribution interval.
- 1.06** "Add" is the abbreviation for Addendum.

Section Number	Issue	Subject
410-100-504	9	Noise and Tones
410-100-505	2	40 Mc Shifter Tone Test
410-100-506	1	Carrier Frequency Measurements
410-100-507	7	Envelope Delay
410-100-508	6	Message Service Connections and Levels
410-100-509	2	Television Service Connections and Levels
410-100-510	4	Received Signal Level
Add 410-100-513	1	
410-100-513	2	Noise Loading

**2. LAYERS**

**2.01** This division is arranged in layers as follows:

- 410-0 Indexes and Equipment Test Lists
  - 1 Overall System
  - 2 FM Terminals
  - 4 Transmitter-Receiver Bay
  - 6 Automatic Protection Switching
  - 7 Maintenance Center
  - 8 Antenna Duplexing
  - 9 Auxiliary Equipment

**410-2 FM TERMINALS**

**Transmitter**

**410-200 General**

**Description**

Add 410-200-101	1	
410-200-101	1	J68336A FM Transmitter
Add 410-200-102	2	
410-200-102	1	J68336K FM Transmitter

**Operation**

410-200-301	1	Placement In and Removal From Service
-------------	---	---------------------------------------

**Tests**

410-200-501	2	In-Service Checks
Add 410-200-502	1	
410-200-502	5	Supply Voltages and Filament Activity
410-200-503	2	Capacitor Check
410-200-510	1	Over-all Transmission
410-200-511	2	Test Charts

**3. INDEX**

Section Number	Issue	Subject
----------------	-------	---------

**410-0 INDEXES AND EQUIPMENT TEST LISTS**

- ♠ 410-000-000 54 Numerical Index — Division 410 — TD-2 Microwave Radio
- 410-001-011 13 ETL — TD-2 Microwave Radio

**410-1 OVERALL SYSTEM**

**Description**

410-100-100	3	General
-------------	---	---------

**Operation**

410-100-301	1	Initial Lineup of Channels
-------------	---	----------------------------

**Tests**

410-100-500	5	General Test Information
410-100-501	4	Channel Net Gain
410-100-502	5	Baseband Response
410-100-503	2	Differential Phase and Gain

**410-202 Control Panel**

**Tests**

410-202-511	1	Supply Voltage Noise Measurement
410-202-512	1	Voltage and Resistance Tables

**410-204 Video Amplifier**

**Tests**

410-204-501	1	AFC Gate Pulse Level
-------------	---	----------------------

**NOTICE**

Not for use or disclosure outside the Bell System except under written agreement

## SECTION 410-000-000

Section Number	Issue	Subject
410-204-502	1	Noise and Vibration Check
410-204-503	1	Gain and Baseband Response
410-204-511	1	Longitudinal Current Suppression Adjustment
410-204-512	1	Square Wave Response
410-204-513	1	Differential Phase and Gain
410-204-514	1	AFC Gate Pulse Rate Adjustment
410-204-515	2	J68336 FM Transmitter — Voltage and Resistance Tables

### 410-206 FM Generator

#### Tests

Add	410-206-501	1	
	410-206-501	3	J68336 — Klystron Replacement and Tuning and AFC Tests
Add	410-206-502	1	
	410-206-502	2	J68336 — Rest Frequency
Add	410-206-503	1	
	410-206-503	2	DO Klystron Sensitivity
Add	410-206-504	3	
	410-206-504	2	DO Klystron Linearity
	410-206-505	1	Output Level
	410-206-506	1	Wavemeter Lubrication and Calibration
	410-206-511	1	Voltage and Resistance Tables

### 410-208 Limiter-Amplifier

#### Tests

Add	410-208-501	1	
	410-208-501	1	Limiter Action and Output Levels
	410-208-511	1	Return Loss
	410-208-512	1	Voltage and Resistance Tables

### 410-210 AFC Unit

#### Tests

	410-210-501	1	Repeller Noise Check
	410-210-502	1	AFC Pull-In Check
	410-210-511	1	Return Loss
	410-210-512	1	Pulse Modulator Balance Adjustment
	410-210-513	1	Discriminator Network Adjustment
	410-210-514	1	Discriminator Performance Check
	410-210-515	1	Voltage and Resistance Tables

Section Number	Issue	Subject
----------------	-------	---------

### Receiver

#### 410-220 General

#### Description

Add	410-220-101	1	
	410-220-101	1	J68336G FM Receiver

#### Operation

	410-220-301	1	Placement In and Removal From Service
--	-------------	---	---------------------------------------

#### Tests

	410-220-501	2	Supply Voltages and Electron Tube Tests
	410-220-502	3	J68336G FM Receiver — Capacitor Check

Add	410-220-509	1	
	410-220-509	2	Linearity and Limiter Bias

Add	410-220-510	1	
	410-220-510	1	Overall Transmission

	410-220-511	1	Receiver Check When FM Transmitter not Available Locally
--	-------------	---	--

#### 410-222 Limiter-Detector

#### Tests

	410-222-511	1	Return Loss
--	-------------	---	-------------

#### 410-224 Video Amplifier

#### Tests

	410-224-511	1	Gain and Baseband Response
	410-224-512	1	Voltage Table

### 410-4 TRANSMITTER-RECEIVER BAY

#### 410-400 General

#### Operation

Add	410-400-303	1	
	410-400-303	1	TD-2 Operation With Portable Microwave Repeater

#### Mechanical Procedures

	410-400-701	1	Bay Alignment
--	-------------	---	---------------

#### 410-410-Transmitter-Receiver Bay

•	410-410-100	5	General Description
	410-410-500	6	Tests
	410-410-501	5	Microwave Generator
	410-410-502	2	40-MHz Shifter
	410-410-503	2	Transmitter Tests — IF Buffer Amplifier
	410-410-504	3	Receiver Control Panel and Power and Metering Panel

Section Number	Issue	Subject
410-410-505	4	Receiver Modulator — IF Preamplicifier
410-410-506	7	Overall Receiver — Maintenance
410-410-507	6	Transmitter Modulator — Maintenance and Description
410-410-508	6	Overall Transmitter—Maintenance and Description—TD-2 Microwave Radio
410-410-509	3	Transmitter Control Panel, Output Monitor, and Power and Metering Panel — Description and Troubleshooting
410-410-510	1	General — Tests — Leakage
410-410-511	1	Impulse Noise Troubleshooting
410-410-512	4	Fade Margin Tests
410-410-513	1	Cross Polarization Test
410-410-514	2	Receiver Space Diversity — Diversity Switch
♥ 410-410-516	1	Transmitter Receiver Bay-General — Tests — RF Leakage

**410-6 AUTOMATIC PROTECTION SWITCHING**

**410-600 Overall System**

**Description**

410-600-100 3 Description

**Operation**

410-600-300 2 Operation  
 410-600-301 2 Patching Procedures

**Tests**

410-600-500 2 General  
 410-600-501 3 In-Service Operate Check  
 410-600-502 3 Out-of-Service Operate Checks  
 410-600-503 3 Transmitting Automatic Switch  
 410-600-504 5 Receiving Automatic Switch  
 410-600-505 1 Auxiliary Station  
 410-600-506 1 Channel Maintenance Switching  
 410-600-507 1 System Timing Tests  
 410-600-508 3 Unit Timing Tests  
 410-600-509 1 Trouble Shooting Aids

**410-602 Switching Controls**

**Description**

410-602-100 6 Description

**Tests**

410-602-501 2 Frequency Check  
 410-602-502 1 Output Level Check  
 410-602-503 2 Lockout Delay Time Check  
 410-602-504 1 Manual Operation Check  
 410-602-505 1 Alarm Delay Operate Time  
 410-602-506 5 Relay Sensitivity Check  
 410-602-507 5 Recycling Test  
 Add 410-602-508 1  
 410-602-508 3 Local IF Switch Operation  
 410-602-509 2 Electron Tube and Relay Tests  
 410-602-510 1 Power Supply Voltages  
 410-602-511 2 Overall VF Line Transmission

**410-604 Channel Initiator**

**Description**

Add 410-604-100 1  
 410-604-100 2 Description

**Operations**

410-604-301 1 Placement In and Removal From Service

**Tests**

410-604-500 1 General Test Information  
 410-604-501 2 Filament Activity  
 410-604-502 1 Input Return Loss  
 410-604-503 1 IF Transmission Test  
 410-604-504 2 Linearity Test  
 410-604-505 1 Coarse Linearity Adjustment  
 410-604-506 1 Monitoring Video Amplifier Adjustment  
 410-604-507 2 Local Oscillator Tuning Check  
 410-604-508 5 Adjustment of Reinserted Pilot  
 410-604-509 2 Modulator and Pilot IF Amplifier Tuning and Detector Tests  
 410-604-510 6 Pilot Switch Adjustment  
 410-604-511 2 Slicer Circuit Tests  
 410-604-512 5 Noise Detector and Fade Switch Adjustment  
 410-604-513 1 Trouble Location Tests  
 410-604-514 1 Voltage Measurements

## SECTION 410-000-000

Section Number	Issue	Subject
<b>410-606 Video Pilot Supply and Distribution Circuit</b>		
<b>Description</b>		
410-606-100	2	Description
<b>Operation</b>		
410-606-301	1	Placement In and Removal From Service
<b>Tests</b>		
410-606-500	3	Tests
<b>410-608 IF Pilot Resupply and Transfer Panel</b>		
<b>Description</b>		
Add 410-608-100	1	
410-608-100	2	Description
<b>Operation</b>		
410-608-300	2	Preparation for Service
<b>Tests</b>		
410-608-500	6	Tests
<b>FM Terminal Switching</b>		
<b>410-610 FM Transmitter Switching</b>		
<b>Description</b>		
410-610-100	6	Overall System
410-610-101	3	FM Receiver
410-610-102	5	Automatic and Manual Control Circuits
410-610-103	3	Indications, Alarms, and Alarm Circuits
410-610-104	2	Monitoring and Test Facilities
410-610-105	1	Power and Power Distribution
<b>Operation</b>		
410-610-300	5	Operation
<b>Tests</b>		
410-610-500	5	Overall System Tests
410-610-501	3	FM Receiver
410-610-502	2	Controls, Indications, and Alarms
410-610-504	1	Metering Circuit Maintenance
<b>410-611 FM Receiver Switching</b>		
<b>Description</b>		
410-611-100	6	Overall System
410-611-101	1	Pilot Detection Using J68769A Amplifier-Rectifier
410-611-102	5	Automatic and Manual Control Circuits

Section Number	Issue	Subject
410-611-103	3	Indications, Alarms, and Alarm Circuits
410-611-104	2	Monitoring and Test Facilities
410-611-105	1	Power and Power Distribution
<b>Operation</b>		
410-611-300	4	Overall System
<b>Tests</b>		
410-611-500	4	Overall System
410-611-501	2	Controls, Indications, and Alarms
410-611-502	1	Pilot Detection Using J68769A Amplifier-Rectifier

### 410-612 Common Equipment

<b>Description</b>		
410-612-101	2	J68381BK IF Amplifier
410-612-102	2	Pilot Detection
410-612-103	1	Voltage Regulator
<b>Tests</b>		
Add 410-612-501	2	
410-612-501	3	FM Terminal Switching — J68381BK, J68381EG, and J68389AC IF Amplifiers
410-612-502	5	Baseband Amplifier-Rectifier
410-612-503	2	Metering Circuit
410-612-504	2	Voltage Regulator
410-612-505	1	Overall System

## 410-7 MAINTENANCE CENTER

### FM Transmitter Tests

#### 410-700 Limiter-Amplifier

<b>Tests</b>		
410-700-501	1	Electron Tube Tests
410-700-502	1	Return Loss
410-700-503	1	Gain and Frequency Response

#### 410-702 AFC Unit

<b>Tests</b>		
Add 410-702-501	1	
410-702-501	1	Return Loss

### FM Receiver Tests

#### 410-710 Limiter-Detector

<b>Tests</b>		
410-710-501	1	Return Loss

Section Number	Issue	Subject
410-710-502	1	IF Amplifier Gain and Frequency Response
410-710-503	2	IF Amplifier Interstage Alignment
410-710-504	2	J68336G — Frequency Response
410-710-505	1	Discriminator Adjustment

**Transmitter-Receiver Bay**

**Tests**

410-720-500	4	Receiver Converter and J68330 IF Preamplifier
410-721-500	2	J68387P Receiver Modulator and IF Preamplifier
410-722-500	3	J68330 IF Preamplifier
410-724-500	4	J68330A IF Main Amplifier
410-724-501	1	(J68330T) IF Main Amplifier
410-726-500	3	IF Buffer Amplifier
410-727-500	2	J68330S IF Buffer Amplifier
410-728-500	3	Transmitter Modulator
410-730-500	7	Transmitter Amplifier
410-731-500	1	88A Power Unit

**410-8 ANTENNA DUPLEXING**

410-802-302	1	Waveguide-Antenna System Restoration
Add 410-802-303	1	
410-802-303	1	Temporary Single Antenna Operation for Emergency Use

**410-9 AUXILIARY EQUIPMENT**

- 410-900) IF Auxiliary Equipment**
- 410-904)**
- 410-900 IF Switching and Distribution Amplifiers**

**Description**

410-900-100	2	Description
-------------	---	-------------

**Tests**

410-900-330	2	Periodic Test Intervals
410-900-500	3	Tests

**410-902 IF Auxiliary Amplifier**

**Description**

410-902-100	2	Description
-------------	---	-------------

**Operation**

410-902-300	3	Operation
-------------	---	-----------

Section Number	Issue	Subject
----------------	-------	---------

**Tests**

410-902-330	2	Periodic Test Intervals
410-902-500	3	Tests

**410-904 IF Bridging Amplifier**

**Description**

410-904-100	1	Description
-------------	---	-------------

**Operation**

410-904-301	1	Placement In and Removal From Service
-------------	---	---------------------------------------

**Tests**

410-904-330	1	Periodic Test Intervals
Add 410-904-501	1	
410-904-501	3	Tests

**410-910) Baseband Auxiliary Equipment**

**410-914) Video Monitor Amplifier**

**Description**

410-910-100	2	Description
-------------	---	-------------

**Operation**

410-910-300	2	Operation
-------------	---	-----------

**Tests**

410-910-500	2	Tests
-------------	---	-------

**410-912 Patching and Monitoring Equipment**

**Description**

410-912-100	2	Description
-------------	---	-------------

**Operation**

410-912-300	2	Operation
-------------	---	-----------

**Tests**

410-912-330	2	Periodic Test Intervals
410-912-500	2	Tests

**410-914 Program and Terminal Maintenance Switching**

**Description**

410-914-100	1	Description
-------------	---	-------------

**Operation**

410-914-300	1	Operation
-------------	---	-----------

**Tests**

410-914-500	3	Tests
-------------	---	-------